

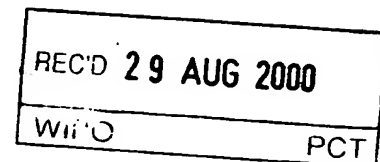


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Patentanmeldung Nr. Patent application No. Demande de brevet n°

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**Blatt 2 der Bescheinigung**  
**Sheet 2 of the certificate**  
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**METHOD AND APPARATUS FOR USE WITH E-MAIL**

The invention relates to a method of and apparatus for notifying a subscriber of the receipt of e-mail at a mail centre.

5

In prior art e-mail systems, a subscriber at a remote location accesses his e-mail by logging on to the server of his internet service provider (ISP). The ISP has a mail centre which is responsible for sending and retrieving e-mails to and from the internet, and for storing retrieved e-mails. When the subscriber logs on to the ISP, it informs him of whether or  
10 not he has e-mail waiting for him at the mail centre; any such e-mail is then downloaded to the subscriber.

A problem in the prior art is that the subscriber can only tell if he has mail by logging on to the ISP. If there is no mail waiting, then this time is wasted.

15

According to a first aspect of the present invention there is provided a method of notifying a subscriber of the receipt of e-mail by a mail centre comprising transmitting a notification message in a broadcast signal.

20 The notification message may be sent without any (direct) user prompt.

By transmitting the notification message in a broadcast signal the subscriber may be informed of the receipt of e-mail by the mail centre, without the need for the subscriber to log on to the mail centre.

25

The notification message may include an identifier of the receiver/decoder to which the notification message is to be sent. This can allow the receiver/decoder to extract only those notification messages which are destined for the subscriber or subscribers which use that receiver/decoder. Preferably, the receiver/decoder compares the identifier with an  
30 identifier which is stored at the receiver/decoder. For example, the receiver/decoder may have a smartcard number and the identifier may comprise at least part of the smartcard number. This can provide a convenient way for the notification message to address the relevant receiver/decoder.

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As used herein, the term "smartcard" includes, but not exclusively so, any chip-based card device, or object of similar function and performance, possessing, for example, microprocessor and/or memory storage. Included in this term are devices having alternative physical forms to a card, for example key-shaped devices such as are often  
5 used in TV decoder systems.

Preferably the method further comprises storing information relating to e-mail accounts, for example, e-mail addresses, aliases, passwords, user preferences and so forth. The information is preferably stored at the operator, which may be at a central location. This  
10 can allow the operator to manage e-mail accounts.

In order to identify the subscriber to which the notification message should be sent, information relating to e-mail accounts is preferably linked to identifiers of receiver/decoders. For example, notification messages may be sent to receiver/decoders  
15 having smartcard numbers and the information relating to e-mail accounts may be linked to the smartcard numbers. This can allow the operator to relate information, such as e-mail addresses, to smartcard numbers, so that it is known to which receiver/decoder the notification message should be sent.

20 The broadcast signal may be part of a subscription service and information relating to e-mail accounts may be linked to information relating to the subscription service. This can allow the subscriber's e-mail account to be managed together with the subscription service.

25 The notification message may contain various pieces of information which can be made available to the subscriber, for example for display on a television screen or on the display of a set-top box. For example, the notification message may comprise an identifier of the recipient of the e-mail (since one receiver/decoder may be used for several e-mail accounts), or an identifier of the sender of the e-mail. The notification message may also  
30 comprise at least part of the text of the e-mail, for example the title or the subject of the e-mail. It should be noted that the text may be coded for transmission, and decoded by the receiver/decoder.

Preferably, a receiver/decoder generates a signal for displaying at least part of the

- 3 -

notification message, such as an identifier of the recipient of the e-mail, an identifier of the sender of the e-mail, or part or all of the text of the e-mail. The receiver/decoder may be the subscriber's receiver/decoder and the signal may be for displaying at least part of the message, for example, on a television screen or on the display of the receiver/decoder.

5

The method may further comprise storing preferences selected by the subscriber, for example, concerning whether or not the subscriber wishes to be notified of e-mail, and the number of e-mails that he wishes to be notified of.

10 Preferably, the subscriber is notified of a selected number of e-mails. For example, the subscriber may be notified of each e-mail received by the mail centre, or the subscriber may be notified only of the first e-mail received by the mail centre since the subscriber last accessed the mail centre.

15 The invention has particular application in the broadcast of digital data, into which additional information may be readily inserted, and thus the broadcast signal is preferably a digital data stream, preferably transmitted via a digital transmission system. As used herein, the term "digital transmission system" includes any transmission system for transmitting or broadcasting for example primarily audiovisual or multimedia digital data.

20 Whilst the present invention is particularly applicable to a broadcast digital television system, the invention may also be applicable to a fixed telecommunications network for multimedia internet applications, to a closed circuit television, and so on.

To reduce the amount of data that is transmitted, the digital data stream may be

25 compressed using a digital compression technique, such as MPEG or other known compression techniques. The term MPEG refers to the data transmission standards developed by the International Standards Organisation working group "Motion Pictures Expert Group" and in particular but not exclusively the MPEG-2 standard developed for digital television applications and set out in the documents ISO 13818-1, ISO 13818-2,

30 ISO 13818-3 and ISO 13818-4. In the context of the present patent application, the term includes all variants, modifications or developments of MPEG formats applicable to the field of digital data transmission.

The notification message may be sent using any known technique which allows the

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insertion of a message into the broadcast signal; for example the notification message may be sent as a section of the digital data stream, such as an MPEG section, or by way of an entitlement management message (EMM).

- 5 The method may further comprise providing the subscriber with a receiver/decoder to receive and/or to decode the broadcast signal. It should be noted that two or more subscribers may share the same receiver/decoder. The term "receiver/decoder" used herein may connote a receiver for receiving either encoded or non-encoded signals, for example, television and/or radio signals, which may be broadcast or transmitted by some
- 10 other means. The term may also connote a decoder for decoding received signals. Embodiments of such receiver/decoders may include a decoder integral with the receiver for decoding the received signals, for example, in a "set-top box", such a decoder functioning in combination with a physically separate receiver, or such a decoder including additional functions, such as a web browser, a video recorder, or a television.

15

The invention is particularly suitable for use with a television broadcast system, and thus the broadcast signal may comprise a television signal. As used herein, "television broadcast system" includes for example and satellite, terrestrial, cable and other system.

- 20 Preferably the notification message is pushed to the subscriber, by which it is preferably meant that the subscriber takes no specific action to enquire about whether e-mail is waiting.

- According to a second aspect of the present invention there is provided a method of
- 25 notifying a subscriber of the receipt of e-mail by a mail centre, which e-mail is to be transmitted to the subscriber via a first medium, comprising transmitting a notification message, indicating the receipt of e-mail by the mail centre, to the subscriber via a second medium, different from the first medium.

- 30 Preferably the first medium is a switched medium and the second medium is a broadcast medium.

The second aspect may further comprise any of the features of the first aspect and *vice versa*.



- 5 -

In an apparatus embodiment of the present invention there is provided apparatus for notifying a subscriber of the receipt of e-mail comprising means for transmitting a notification message together with a broadcast signal.

- 5 The notification message may include an identifier of a receiver/decoder to which the notification message is to be sent.

- The apparatus may further comprise means for storing information relating to e-mail accounts. Information relating to e-mail accounts may be linked to identifiers of receiver/decoders. The information relating to e-mail accounts may be linked to the smartcard numbers of decoders. The broadcast signal may be part of a subscription service and information relating to e-mail accounts may be linked to information relating to the subscription service.
- 10

- 15 The notification message may comprise an identifier of the recipient of the e-mail. The notification message may comprise an identifier of the sender of the e-mail. The notification message may comprise at least part of the text of the e-mail.

- The apparatus may further comprise means for storing preferences selected by the subscriber.
- 20

- The apparatus may be adapted to notify the subscriber of a selected number of e-mails. The apparatus may be adapted to notify a subscriber of each e-mail received by the mail centre. The apparatus may adapted to notify a subscriber only of the first e-mail received by the mail centre since the subscriber last accessed the mail centre.
- 25

The broadcast signal may be a digital data stream. The apparatus may further comprise means for compressing the digital data stream using a digital compression technique.

- 30 The apparatus may be adapted to send the notification message as a section of the digital data stream. The apparatus may be adapted to send the notification message by way of an entitlement management message.

The broadcast signal may comprise a television signal.

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The apparatus may be adapted to push the notification message to the subscriber.

According to another apparatus aspect, there is provided apparatus for notifying a subscriber of the receipt of e-mail by a mail centre, which e-mail is to be transmitted to the subscriber via a first medium, comprising means for transmitting a notification message, indicating the receipt of e-mail by the mail centre, to the subscriber via a second medium, different from the first medium.

The first medium may be a switched medium and the second medium may be a broadcast medium.

According to another apparatus aspect, there is provided a receiver/decoder for receiving and/or decoding a broadcast signal, comprising means for receiving, together with a broadcast signal, a notification message for notifying a subscriber of the receipt of e-mail by a mail centre.

The receiver/decoder may be adapted to compare an identifier in the notification message with an identifier which is stored at the receiver/decoder. The receiver/decoder may have a smartcard number and the identifier may comprise at least part of the smartcard number.

The receiver/decoder may generate a signal indicating the receipt of e-mail by the mail centre. The receiver/decoder may generate a signal for displaying at least part of the notification message.

According to another apparatus aspect there is provided a receiver/decoder for receiving and/or decoding a broadcast signal, comprising means for receiving e-mail via a first medium and means for receiving a notification message, indicating the receipt of e-mail by the mail centre, via a second medium different from the first medium.

The first medium may be a switched medium and the second medium may be a broadcast medium.

There may be provided a system for notifying a subscriber of the receipt of e-mail comprising apparatus as described above and a receiver/decoder as described above.

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The invention also provides an internet account management system for use with a broadcast system.

- 5 Method features may be applied to the apparatus aspects and *vice versa*. Features of one aspect may be applied to other aspects.

Preferred features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, in which:-

10

Figure 1 shows the architecture of a typical digital television system;

Figure 2 is a schematic diagram of a receiver/decoder;

Figure 3 shows an overview of an internet access system;

Figure 4 illustrates software layers in the user equipment of Figure 3;

15

Figure 5 shows the architecture of an internet access system;

Figure 6 shows the main components of an internet account management system; and

Figure 7 shows the structure of an entitlement management message.

- 20 An overview of a digital television system 1 is shown in Figure 1. The invention includes a mostly conventional digital television system 2 that uses the known MPEG-2 compression system to transmit compressed digital signals. In more detail, MPEG-2 compressor 3 in a broadcast centre receives a digital signal stream (typically a stream of video signals). The compressor 3 is connected to a multiplexer and scrambler 4 by  
25 linkage 5.

- The multiplexer 4 receives a plurality of further input signals, assembles the transport stream and transmits compressed digital signals to a transmitter 6 of the broadcast centre via linkage 7, which can of course take a wide variety of forms including  
30 telecommunications links. The transmitter 6 transmits electromagnetic signals via uplink 8 towards a satellite transponder 9, where they are electronically processed and broadcast via notional downlink 10 to earth receiver 12, conventionally in the form of a dish owned or rented by the end user. Other transport channels for transmission of

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the data are of course possible, such as terrestrial broadcast, cable transmission, combined satellite/cable links, telephone networks etc.

The signals received by receiver 12 are transmitted to an integrated receiver/decoder  
5 13 owned or rented by the end user and connected to the end user's television set 14.  
The receiver/decoder 13 decodes the compressed MPEG-2 signal into a television  
signal for the television set 14. Although a separate receiver/decoder is shown in  
Figure 1, the receiver/decoder may also be part of an integrated digital television. As  
used herein, the term "receiver/decoder" includes a separate receiver/decoder, such as  
10 a set-top box, and a television having a receiver/decoder integrated therewith.

In a multichannel system, the multiplexer 4 handles audio and video information  
received from a number of parallel sources and interacts with the transmitter 6 to  
broadcast the information along a corresponding number of channels. In addition to  
15 audiovisual information, messages or applications or any other sort of digital data may  
be introduced in some or all of these channels interlaced with the transmitted digital  
audio and video information.

A conditional access system 15 is connected to the multiplexer 4 and the  
20 receiver/decoder 13, and is located partly in the broadcast centre and partly in the  
receiver/decoder. It enables the end user to access digital television broadcasts from  
one or more broadcast suppliers. A smartcard, capable of deciphering messages  
relating to commercial offers (that is, one or several television programmes sold by the  
broadcast supplier), can be inserted into the receiver/decoder 13. Using the  
25 receiver/decoder 13 and smartcard, the end user may purchase commercial offers in  
either a subscription mode or a pay-per-view mode.

As mentioned above, programmes transmitted by the system are scrambled at the  
multiplexer 4, the conditions and encryption keys applied to a given transmission being  
30 determined by the access control system 15. Transmission of scrambled data in this  
way is well known in the field of pay TV systems. Typically, scrambled data is  
transmitted together with a control word for descrambling of the data, the control word  
itself being encrypted by a so-called exploitation key and transmitted in encrypted

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form.

The scrambled data and encrypted control word are then received by the receiver/decoder 13 having access to an equivalent to the exploitation key stored on a smart card inserted in the receiver/decoder to decrypt the encrypted control word and thereafter descramble the transmitted data. A paid-up subscriber will receive, for example, in a broadcast monthly ECM (Entitlement Control Message) the exploitation key necessary to decrypt the encrypted control word so as to permit viewing of the transmission.

10

An interactive system 16, also connected to the multiplexer 4 and the receiver/decoder 13 and again located partly in the broadcast centre and partly in the receiver/decoder, enables the end user to interact with various applications via a modemed back channel 17. The modemed back channel may also be used for communications used in the conditional access system 15.

Physical interfaces of the receiver/decoder 13 are used for downloading data. With reference to Figure 2, the receiver/decoder 13 contains, for example, six downloading devices; MPEG flow tuner 4028, serial interface 4030, parallel interface 4032, modem 4034 and two card readers 4036.

The broadcast and reception system is also used to provide internet services such as web browsing and e-mail. An application which is run by the receiver/decoder 13 enables the receiver/decoder to access internet services and to display web pages and e-mails either on television set 14 or via a computer connected to the receiver/decoder 13.

Referring to Figure 3, an overview of the internet access system will be described. User equipment 20 (which includes a receiver/decoder) communicates with operator 22 via the public switched telephone network (PSTN) 24. The user equipment sends a request to the operator 22 to be sent certain data, for example, a particular web page or e-mail. The operator receives this request and outputs the request to internet service provider (ISP) 26. In response to this request, the ISP supplies a response to the operator, which might comprise a requested web page obtained from the internet 27,

- 10 -

or an e-mail which was waiting for the subscriber at the ISP. The operator delivers the response to the broadcast centre 28, where it is integrated into a private section of the MPEG bitstream and transmitted by the transmitter 6 and received by receiver 12 as previously described. The user equipment 20 extracts the response from the MPEG bitstream and displays it on a television set or on a computer screen. The response may alternatively be transmitted to user equipment 20 via the PSTN 24.

As shown in figure 4, the software levels employed in the user equipment 20 comprise a web browser application, such as Netscape or Microsoft Internet Explorer, an e-mail application such as Microsoft Outlook Express, HTTP, socket, TCP/IP, PPP/SLIP and a driver level. The driver level is modified, as compared with a browser application running traditionally on a PC, in that it is divided into a modem driver for communicating with the PSTN 24 via the modem of the user equipment and a tuner driver for communicating via the MPEG flow tuner 4028.

Various configurations of the user equipment 20 are possible. In one configuration a PC is not used and all of the user software runs on the receiver/decoder 13. In this configuration the receiver/decoder 13 communicates with the PSTN 24 either via an internal modem or via an external modem and the serial port. The receiver/decoder 13 can receive Internet responses in the bitstream from the earth receiver 12. In this configuration, the user interface is provided by a remote controller and a television set connected to the receiver/decoder 13.

In another configuration a personal computer (PC) is provided which is connected by its parallel port to the parallel port 4032 of the receiver/decoder 13 (or optionally by its serial port to the serial port 4030 of the receiver/decoder 13). In this case, an upper portion of the software levels shown in Figure 4 run on the PC, and the remaining lower portion of the software levels run on the receiver/decoder 13. The user interface is provided by a keyboard and a monitor connected to the PC.

In a further configuration a PC is connected to the PSTN 24 via an internal or external modem of the PC. In this configuration, the receiver/decoder 13 may be provided separately or in the form of an add-on or plug-in card of the PC, connected to the ISA

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or PCI bus thereof.

The architecture of the internet access system is shown in Figure 5. Referring to Figure 5, internet account management system (IAMS) 50 is linked to internet service provider (ISP) 26 which provides services such as web browsing and e-mail. The IAMS 50 is also linked to subscriber management system (SMS) 60 which manages subscribers and sends requests to the IAMS to grant or deny access to internet services. The main functions of the IAMS are as follows:

- 10      ○ maintaining a centralised list of e-mail account parameters linked to subscriber parameters such as smartcard number
- granting or denying access to internet services for a subscriber at the request of the SMS
- customising internet accounts at the request of subscribers (provisioning)
- 15      ○ reminder service, which allows an e-mail user to register an event and to be warned by an e-mail at the time of the event
- replication service, which allows updates of the IAMS contents to be copied to a related server, such as an ISP
- 20      Receiver/decoder 13 runs an e-mail application that allows a registered e-mail user to send and receive e-mail and to access the IAMS for provisioning and reminder services. Receiver/decoder 13 is connected to the IAMS via an internal modem, the public switched telephone network (PSTN) 24, network access server (NAS) 56, and gateway 58. Receiver/decoder 13 also accesses the ISP 26 via gateway 58, although where
- 25      receiver/decoder 13 is equipped with the necessary protocols, it may communicate directly with the ISP via the PSTN, as is indicated by dashed line 57.

Gateway 58 allows subscribers to access internet services in real time. Such services include mail services for sending and receiving mail and other services which may be provided by ISP 26, and provisioning services and reminder services, which are provided by the IAMS. The gateway 58 is a message router that enables simultaneous communication in a single modem connection. In respect of IAMS features, the gateway is responsible for redirecting the requests to the provisioning server (for e-mail account management) and to the reminder server (to manage reminder events).

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ISP interface 66 allows each modification related to a user's account which takes place in the IAMS to be duplicated to a user account in ISP 26 in charge of hosting internet services, such as mail services. It should be noted that all information relating to subscriber accounts is centralised in the IAMS, which ensures the management of TV and internet parameters.

Subscriber management system (SMS) 60 manages subscribers and sends requests to the IAMS in order to grant or to deny access to internet services by subscribers.

- 10 In order to set up a e-mail account, a subscriber first sends a request for a new account, together with the selected options, from the receiver/decoder 13 to the IAMS 50. The IAMS checks the smartcard number of the subscriber against a list of smartcard numbers, obtained from subscriber management system (SMS) 60, corresponding to subscribers for which it may set up e-mail and internet accounts. The IAMS then sends a request to the
- 15 ISP to set up an e-mail account. Once the account has been set up, the ISP returns an acknowledgement to the IAMS, together with the e-mail address and password for the e-mail account. This information is stored in the IAMS, along with the smartcard number of the subscriber. The IAMS informs the subscriber that his account has been set up. The subscriber can then send and receive mail to and from the mail server 28 via gateway 18
- 20 using the e-mail password. Alternatively, if the receiver/decoder is equipped with the necessary protocols, it may access the mail server directly via the PSTN, rather than via the gateway.

- Two types of account may be distinguished for accessing internet services from a receiver/decoder or a PC: a "connection account" and a "directory account". A connection account allows a subscriber to access the operator network. A subscriber is provided with a single connection account per operator, possibly associated with several connection profiles. Authentication takes place at network level. A directory account allows access to internet services (Proxy with authentication, mail, news). A subscriber's
- 30 directory accounts are linked to his connection account. Authentication takes place at application level.

With reference to a connection account, a "connection profile" allows a subscriber to connect to the operator network. Examples of different profiles that a subscriber may



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have are:

- profiles for connection from a computer (using, for example, MediaWebPC supplied by Canal+), with a return by modem and by satellite or cable
- 5 - profiles for connection from a receiver/decoder

A "login" and password are used for authentication of a subscriber when he logs on to the operator network. The protocols used may be, for example, PAP or CHAP of PPP for dial-up modems a "login"/password sequence for access via Raw-TCP mode, or  
10 protocols to be determined for access via a cable network.

The connection profiles are used by the authentication server(s) of the operator (in general RADIUS servers). Each "login" has to be unique. The uniqueness is assured through the use of the "MSD" number, as explained below.

15

The directory account allows the access to the internet services to be controlled from the computer. A directory account consist of:

- an identifier and a password
- 20 - one or more e-mail aliases
- other data relating to services offered to subscribers

The identifier is used to enable a subscriber to gain access to his mailbox, and for the management of the access by the subscribers to certain ISP services (private websites, directories, control of access to services, certificates, registration in "mailgroups" etc.).  
25

The identifier is also used to receive emails addressed to "identifier@domain". The password is used when the subscriber accesses his mailbox identified by the identifier.

30 The e-mail aliases are used by the email server to receive e-mails addressed to "alias@domain".

The subscriber identifier is also used to control access to web pages with access restrictions, Proxy with authentication servers, News servers etc.

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It is possible to associate several directory accounts with one single connection account (family subscription). The number of directory accounts which is allowed per connection account can be specified. The number of screen names associated with a directory account is limited. Each identifier and each screen name has to be unique.

5

Each subscriber connection profile consist of a login and a password.

The login field of a connection profile consists, as of the MSD number of the subscriber, of the type of terminal used (PC or TV), of the type of return selected (satellite or modem), of the client version and, if applicable, of the RADIUS domain name of the client:

10

{MSD\_number}{terminal\_type}{return\_type}{version}[@RADIUS\_domain\_name]],

15 with the fields in square brackets being optional.

The "MSD\_number" field consists of the following string of fields:

20 \* RSMC (Removable Security Module Product Code). This code identifies the type of SmartCard and the commercial operator who owns the card. This field is 2 bytes long, and a maximum of four digits.

\* RSMN (Removable Security Module Number). This code identifies the SmartCard of the subscriber in a unique manner. This field is 4 bytes long, and a maximum of nine digits.

25 \* Check digit. The check digit is computed based on the two preceding fields and enables verification of the validity of the MSD number. This field is 2 digits long.

In this entire specification, and in the absence of any indication to the contrary the MSD number is always considered with its check digit, hence of 15 digits maximum.

30

The "terminal\_type" field takes the value "P" for a PC type terminal and the value "T" for a TV type terminal. The "return\_type" field takes the value "M" for a pure modem return and the value "S" for a mixed satellite and modem return. The "version" field consists of two numeric characters, which are set to 01 by default.

The domain name RADIUS is managed by the network operator. This field allows a client's authentication request to be directed to the correct authentication server, in the case of the provision by a third party of gateways to different service providers. The field may contain alphanumeric characters, and its length is variable with a maximum of sixteen characters. In view of compatibility with current versions, the default value for this field is null.

The password field consists of letters and numbers with a maximum length of 14 characters. The passwords are identical for all connection profiles of a subscriber (imposed by the connection kit and the CGA/IPS dialogue).

The main components of the IAMS are shown in Figure 6. Central to the IAMS is a relational database management system (RDBMS) 70, which contains subscription information for internet services and e-mail accounts, stored in storage means 72. SMS communication interface 74 allows the IAMS to communicate with the SMS, so that the IAMS may be updated with the details of subscribers who have been granted or denied access to mail services. Provisioning server 76 allows a subscriber to manage and customise his e-mail account, for instance, by selecting various options, as will be described. Reminder server 78 allows a subscriber to manage a list of events. An event is related to a subscriber's e-mail account. A subscriber may register an event and receive an automatic reminder a predetermined number of days before the event via an automatically generated e-mail. E-mail notification interface 84 allows the EMNS 62 to search for a subscriber's notification preferences in the IAMS RDBMS 70 in order to send an over air notification message. Support server 80 allows an administrator to check the presence and the status of a subscriber or an e-mail user in the IAMS. Replication service 82 copies updates of the contents of the IAMS RDBMS 70 to the ISP account management system.

The various components of the IAMS will now be described in more detail.

**The IAMS RDBMS**

The IAMS RDBMS contains subscription information for Internet Service and Mail accounts parameters. The IAMS RDBMS contains three types of parameters:

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- Global parameters: These parameters apply to the whole IAMS system.
  - Subscriber parameters: These parameters are related to the subscriber's accounts.
  - User parameters: These parameters are related to the user's accounts
- 5 (Mail parameters)

## Global parameters:

- Domain name for Mail address,
- Maximum number of Mailboxes per TV account,
- 10 - Maximum number of aliases per E-mail address,
- Maximum number of events (Reminder services) per Email address
- Black list of Email addresses

## For each subscriber:

- 15 - SmartCard number,
- Password (optional)
- Status of the subscriber (Suspended, Activated)
- Last operation type on the subscriber account

## 20 For each Mail account:

- Link to the related subscriber's SmartCard number,
- Email identifier (EmailID@operator\_domain\_name)
- Mailbox password,
- Notification preferences (never being notified, notification at each mail
- 25 received, notification at first new mail)
- User first and last name (as defined by the user via the provisioning server),
- Related list of Reminder events (optional)
- Forward address (optional)
- 30 - Email aliases (optional)
- Status of the Mail account (activated, suspended)
- Replication status
- Last operation type on the Mail account

**Interface with SMS**

Interface with the SMS allows the IAMS to be updated with subscribers having access to Internet services. SMS requests handled by the IAMS are:

- 5
- Subscription creation, cancellation
  - Subscription modification (add the commercial offer or change password, the latest being optional)
  - Subscription suspension, reactivation
  - 10 - SmartCard Exchange

When a subscription is Suspended/Reactivated, all the Mail accounts depending on the related subscriber are Suspended/Reactivated. By cancelling the subscription for a subscriber, all the related Mail accounts are deleted.

15

**Provisioning Server**

This interface allows a subscriber to manage his Email accounts himself for standard actions. Account registration consists of registering the accounts on a centralised database system (the IAMS RDBMS) and replicate them to the Mail servers. Standard

20 actions are:

- Create, modify or delete an e-mail account,
- List the existing Mail accounts related to a subscriber (based on his SmartCard number).

25

The maximum number of e-mail accounts that a subscriber can create is configured as a global parameter.

The subscription process is done online in order to acknowledge the request to the

30 subscriber in real time. To preserve independence between the IAMS system and the ISP account management system, once the request is acknowledged with the subscriber, the request is then sent automatically to the ISP interface, but in asynchronous mode (see Replication Service).

- 18 -

The IAMS stores the status of the replication towards the ISP account management system (In progress, Done, Error etc.).

Whilst the status of the replication on the IAMS RDBMS is not recorded as "Done",  
5 the corresponding Mail account can not be updated.

#### User ID "Black List"

The IAMS manages a user ID "black list" which includes all forbidden user IDs. Once a user ID is added to the User ID black list, the IAMS will ensure that no user will be  
10 delivered the related e-mail address.

#### Quarantine period

In order to prevent an e-mail address to be immediately re-allocated to a alternate user once deleted (and then allowing mails to be delivered to wrong recipient), any deleted  
15 email address is kept in quarantine before being available for a further user allocation by the provisioning server.

The quarantine period automatically expires after a pre-defined delay.

#### 20 Reminder Server

Information about events is stored in the IAMS RDBMS and linked to a user Email account.

The reminder service allows a subscriber to register an event and receive an automatic  
25 reminder 1 to 15 days before the date of the event via an automatically generally Email. Standard actions are:

- Create, modify or delete an event,
- List the existing user events related to a Mail account.

30

An event contains the date of the event, the date of the warning (from 1 to 15 days before the event), an event type (birthday, wedding) and a free text.

- 19 -

The maximum number of events that a subscriber is able to create is configured as a global parameter.

5 A subscriber accesses the reminder service through the Email application on the set-top box, to create, delete event. Up date is done in real time on the IAMS.

The Reminder Server is also in charge of scanning the IAMS RDBMS every day to select the events to be announced. For each event to announce, it composes a new email and sends it to the corresponding Mail address.

10

#### Email Notifier Communication Interface

The Email Notifier System allows subscribers to be notified as soon as they receive a new e-mail in their mailboxes. A short message is sent to their set-top box over-air.

15 Once the EMNS has received a notification request from the ISP, it searches in the IAMS RDBMS for the subscriber's notification preference (on or off) and related parameters needed to compose a notification message. The notification message is then sent to the broadcasting system, in order to be delivered to the subscriber.

#### 20 Republication Service

The replication service is based on a Message Queue System (MQS, a message management system). It receives requests from the IAMS RDBMS, and relays them to the ISP account management system. Request are forwarded in real time, but in an asynchronous manner.

25

All mailbox creation, modification or deletion commands are then replicated to the ISP interface.

30 The IAMS RDBMS stores the status of the replication of each request towards the ISP account management. The IAMS RDBMS expects an acknowledgement of each request processed by the ISP account management system (Done or Error). The acknowledgements exchanged between the ISP and the IAMS RDBMS are managed by the MQS.

- 20 -

The main interests of the MQS are:

- A unique interface between the RDBMS and the ISP account management system,
- 5 - Asynchronous Reliable service: Each message exchange is secured. The asynchronous mode allows both system (IAMS and ISP account management system) to be independent.

The network protocol used is TCP/IP.

10

#### Support Server

The IAMS is provided with a Support Server which help operators with Customer Care. The Support server provides the following features:

- 15 - List Mail accounts for a given subscriber (identified either by his SmartCard number or one of his Email addresses),
- Check the status of a subscriber account (Activated, Suspended),
- Check the replication status of a Mail account (Done, In Progress, Error etc.)
- 20 - Check the matching of a Mail account password
- Check the notification preferences for a Mail account
- List Reminder Events for a mail account
- Check the last operation type on an account, as well as the date of the last operation.

25

#### Administrative Tools

The IAMS is provided with the administrative tools which help IAMS administrators with the following tasks:

- 30 - Remove an single entry from the quarantine list
- Re send a replication command to the ISP

#### Administration



- 21 -

The IAMS is a multi-faceted system implemented through various processes.

The IAMS database contains the operator data which is required for the correct operation of the system. All the tools require to management these data properly are  
5 part of the IAMS furniture.

#### **Administration functions**

The role of the administration tools is to exploit the IAMS system by:

- 10 - Launching each process ,
- Stopping the processes
- Monitoring the processes,
- Setting or retrieving internal parameters of the processes.

#### **15 IAMS High Availability**

The IAMS High availability System is a specialised facility for protecting mission-critical applications from a wide variety of hardware and software failures.

It monitors the health of each node and responds to failures in a way that minimises  
20 application downtime. It is able to detect and respond to failures in the following components:

- System processors
- System memory
- 25 - LAN media and adapters
- System processes
- Application processes

With this system, application services and all the resources needed to support the  
30 application are bundled into special entities called application packages. These application packages are the basic units that are managed and moved within a cluster.

The High Availability System is configured into active-active recovery strategy. In an

- 22 -

active-active configuration, every node runs at least one application package and provides backup services for one or more other packages running on other nodes.

Two application packages are defined:

5

- The IAMS (IAMS RDBMS and Replication Service)
- The subscribers services (Provisioning Server, Reminder Server, Email Notifier)

10 Repartition of services into packages may differ depending on the sizing of the system. Each application is accessed by a virtual IP address which belongs to the package. When a package moves towards the other system, the second system mounts the related disks and activate this virtual IP address.

#### 15 Implementation

- RDBMS
  - Sybase Adaptive Server 11.9.2
- HARDWARE
  - HP/UNIX server
- 20 - OC
  - HP-UX 11.0 Software
  - High availability software
    - HP Multi-Computer/Service Guard
  - Netscape Web Server

25

#### E-mail notification

As shown in Figures 5 and 6, the IAMS is provided with an e-mail notification interface 84, which interfaces with e-mail notification system (block 62 in Figure 5). The e-mail  
30 notification system allows subscribers to be notified as soon as they receive new e-mail in their mail boxes in mail server 64.

The mail server 64 stores e-mails which have been received from the internet and which

- 23 -

are destined for the subscriber. When new mail is received the mail server sends a notification demand to e-mail notification system (EMNS) 62. The notification demand is only sent on receipt of new mail by the ISP 26, that is, it is event driven. The various messages that may be sent from the ISP to the EMNS are as follows:

5

- new e-mail - new e-mail is waiting
- first e-mail - first e-mail since subscriber last connected
- subscriber connected to mail server

10 Once the EMNS has received a notification request from the ISP, it searches in the IAMS RDBMS 70 for the subscriber's notification preferences and related parameters needed to compose a notification message. Various preferences which may be selected by the subscriber include the following:

15

- e-mail notification on or off
- notify each new mail or first mail since last connection to the ISP
- display the sender of the e-mail
- display the recipient of the e-mail

20 The EMNS also checks that the subscriber has not been denied use of the notification system, for example by the SMS. If the above checks reveal that the subscriber should be informed of his e-mail, then a notification message is then generated for relay to the subscriber. The notification message contains the smartcard number of the receiver/decoder of the subscriber concerned, which is extracted from the IAMS RDBMS 70. The smartcard number uniquely identifies the receiver/decoder (although it is not necessarily unique to a subscriber, since a receiver/decoder may serve a plurality of subscribers). The notification message may also contain other information such as information identifying the recipient of the e-mail, information identifying the sender of the e-mail, and text for display by the receiver/decoder, such as the title or subject of the e-mail.

25

30

A request to broadcast the notification message is sent from the EMNS to broadcast centre 63. On receipt of the request, the broadcast centre transmits the notification message at regular intervals for a predetermined amount of time, for example, every 15

- 24 -

minutes for 24 hours. The cycle time may be varied; for example the notification message may be sent relatively frequently for a first period of time and relatively infrequently for a second period of time. The notification message may be sent, for example, as an entitlement management message (EMM) or as an MPEG-2 section.

5

Referring to Figure 7, the structure of an EMM suitable for sending an e-mail notification message is now described. The EMM, which is implemented as a series of digital data bits, comprises a header 3060, the EMM proper 3062, and a signature 3064.

- 10 The header 3060 comprises a type identifier 3066, which in this case identifies the EMM as an individual type (that is, destined for a single subscriber), a length identifier 3068, which gives the length of the EMM, an address 3070, which is based on the smartcard number of the subscriber, an operator identifier 3072 and a key identifier 3074.
- 15 The EMM proper 3062 comprises information identifying the EMM as a mail notification EMM together with other information relating to the mail notification. For example, the EMM may contain information concerning the recipient of the e-mail in the household (where there are several e-mail subscribers each using the same receiver/decoder), the sender of the e-mail, the title or subject of the e-mail, the number of waiting e-mails, and
- 20 so on. Also in this part of the EMM is an index which identifies that particular EMM.

Finally, the signature 3064, which is typically of 8 bytes long, provides a number of checks against corruption of the remaining data in the EMM.

- 25 As mentioned above, instead of using an EMM to transmit the notification message, an MPEG section could also be used, in which any or all of the above information could be included. The advantage of using an MPEG section is that, unlike an EMM, the cycle time is not fixed, so that the notification message may be sent at varying intervals.
- 30 Each receiver/decoder monitors incoming notification messages and extracts those containing the smartcard number of that receiver/decoder. If more than one subscriber is connected to the receiver/decoder, it identifies the particular subscriber to whom the e-mail is addressed, based on information in the notification message. The receiver/decoder then informs the subscriber that e-mail is waiting for him, for example by displaying a

- 25 -

message on the receiver/decoder display, or on the television screen. Other information contained in the notification message may also be displayed.

Finally, when the receiver/decoder has received a mail notification message, it "burns" the message, so that the message is not repeatedly displayed. This is done by comparing incoming mail notification messages to ones that have already been received, and only notifying new messages. Typically, the EMM or MPEG section contains an index identifying that EMM or MPEG section, in which case only the indexes need be compared in order to identify whether that message has already been received and acted upon. Additionally or alternatively, the receiver/decoder 13 could request the EMNS 62 to stop sending the notification message, for example by sending a request via the PSTN 24.

Once the subscriber has been notified of waiting mail, he can send a request to the ISP to send the e-mail. The e-mail may be sent either via the PSTN 24, or via communications link 8,9,10, in the way described above with reference to Figure 3. In an alternative embodiment, on receipt of an e-mail notification message, the receiver/decoder 13 automatically downloads the e-mail and stores it locally for access later by the subscriber.

It will be appreciated that the e-mail notification system described above notifies a subscriber of the arrival of e-mail at a mail centre without the subscriber having to enquire whether e-mail is waiting, that is, the mail notification message is "pushed" to the subscriber.

It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

Each feature disclosed in the description, and (where appropriate) the claims and drawings may be provided independently or in any appropriate combination.

Reference numerals appearing in the claims are by way of illustration only and shall have no limiting effect on the scope of the claims.

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## Glossary

The acronyms and terms in this glossary are defined with respect to the CANAL + Internet Account Management System.

### 5 ACRONYMS

	EMN	Email notifier
	IAMS	Internet Account Management System
	IMAP	Internet Message Access Protocol
	ISP	Internet Service Provider
10	NAS	Network Access Server
	MQS	Message Queue Server
	PSTN	Public Switched Telephone Network
	RDBMS	Relational Database Management System
	SMS	Subscriber Management System
15	STB	Set Top Box
	TCP/IP	Transmission Control Protocol/Internet Protocol

### TERMS

20	Email Address	An Email address is composed of two fields: the Email ID and the domain name. The form of an Email Address is Email_Id@Domain_Name.
	Email Account	An Email Account provides information about the user that a Mail Server needs to process that user's messages.
25	Email Id	The prefix of an email address. An Email Id is unique in a domain name.
	Email Notifier	The Email Notifier System allows subscribers (EMN) to be notified as soon as they receive a new email in their mailboxes. A short message is sent to their STB over-air.
30	Internet Account	A system managing subscriber TV account Management parameters and related Email Accounts System (IAMS) parameters
	Mailbox	Messages stored for IMAP delivery are held in a mailbox. A mailbox on a mail server must be uniquely identified by a

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mailbox Id. A mail server hosting different domain name can not consider that the Email Id is unique on the Mail server, so the mailbox Id must be the Email address.

- Mail Program that exchanges email with other Mail Servers and accepts and delivers messages to mail clients.
- 5 Message Queue Server (MQS) Provisioning Allows a subscriber to create and customise Server his email accounts itself.
- Reminder
- 10 Server Set Allows a user to register an event and receive an automatic reminder via an automatic mail.
- Set Top Box The completely assembled, ready to use (STB) digital decoding hardware, manufactured in accordance with Digital Video Broadcasting standards, CANAL + TECHNOLOGIES specifications. It is used as a digital decoder for transmitted video, audio, application and data streams so that the end user can access television programs and services.
- 15 SmartCard Cards that electronically store the secret keys of one or more commercial operators and other access information.
- 20 Subscriber A subscriber is related to a TV account (i.e.a SmartCard number).
- Subscriber Management
- System (SMS) A system managing data relating to subscribers.
- User A user is related to an email account. There may be multiple
- 25 users for a single subscriber.

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## CLAIMS

1. A method of notifying a subscriber of the receipt of an e-mail by a mail centre, comprising transmitting a notification message in a broadcast signal.  
5
2. A method according to claim 1 wherein the notification message includes an identifier of a receiver/decoder to which the notification message is to be sent.
3. A method according to claim 2 wherein the receiver/decoder compares the  
10 identifier with an identifier which is stored at the receiver/decoder.
4. A method according to claim 2 or 3 wherein the receiver/decoder has a smartcard number and the identifier comprises at least part of the smartcard number.
- 15 5. A method according to any of the preceding claims further comprising storing information relating to e-mail accounts.
6. A method according to claim 5 wherein information relating to e-mail accounts is linked to identifiers of receiver/decoders.  
20
7. A method according to claim 6 wherein notification messages are sent to receiver/decoders having smartcard numbers and the information relating to e-mail accounts is linked to the smartcard numbers.
- 25 8. A method according to any of claims 5 to 7 wherein the broadcast signal is part of a subscription service and information relating to e-mail accounts is linked to information relating to the subscription service.
9. A method according to any of the preceding claims wherein the notification  
30 message comprises an identifier of the recipient of the e-mail.
10. A method according to any of the preceding claims wherein the notification message comprises an identifier of the sender of the e-mail.



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11. A method according to any of the preceding claims wherein the notification message comprises at least part of the text of the e-mail.

12. A method according to any of the preceding claims wherein a receiver/decoder generates a signal for displaying at least part of the notification message, and preferably for displaying an identifier of the recipient and/or sender of the e-mail.

13. A method according to any of the preceding claims further comprising storing preferences selected by the subscriber.

10

14. A method according to any of the preceding claims wherein the subscriber is notified of a selected number of e-mails.

15. A method according to any of the preceding claims wherein a subscriber is notified of each e-mail received by the mail centre.

20

16. A method according to any of claims 1 to 14 wherein the subscriber is notified only of the first e-mail received by the mail centre since the subscriber last accessed the mail centre.

17. A method according to any of the preceding claims wherein the broadcast signal is a digital data stream.

18. A method according to claim 17 wherein the digital data stream is compressed using a digital compression technique.

19. A method according to claim 17 or 18 wherein the notification message is sent as a section of the digital data stream.

20. A method according to claim 17 or 18 wherein the notification message is sent by way of an entitlement management message.

21. A method according to any of the preceding claims including providing the subscriber with a receiver/decoder to receive and/or to decode the broadcast signal.

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22. A method according to any of the preceding claims wherein the broadcast signal comprises a television signal.

23. A method according to any of the preceding claims wherein the notification  
5 message is pushed to the subscriber.

24. A method of notifying a subscriber of the receipt of e-mail by a mail centre, which e-mail is to be transmitted to the subscriber via a first medium, comprising transmitting a notification message, indicating the receipt of e-mail by the mail centre, to  
10 the subscriber via a second medium, different from the first medium.

25. A method according to claim 24 wherein the first medium is a switched medium and the second medium is a broadcast medium.

15 26. Apparatus for notifying a subscriber of the receipt of e-mail by a mail centre, comprising means for transmitting a notification message together with a broadcast signal.

27. Apparatus according to claim 26 wherein the notification message includes  
20 an identifier of a receiver/decoder to which the notification message is to be sent.

28. Apparatus according to claims 26 or 27 further comprising means for storing information relating to e-mail accounts.

25 29. Apparatus according to claim 28 wherein information relating to e-mail accounts is linked to identifiers of receiver/decoders.

30 30. Apparatus according to claim 29 wherein the information relating to e-mail accounts is linked to the smartcard numbers of decoders.

32. Apparatus according to any of claims 28 to 30 wherein the broadcast signal is part of a subscription service and information relating to e-mail accounts is linked to information relating to the subscription service.

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33. Apparatus according to any of claims 26 to 32 wherein the notification message comprises an identifier of the recipient of the e-mail.

34. Apparatus according to any of claims 26 to 33 wherein the notification  
5 message comprises an identifier of the sender of the e-mail.

35. Apparatus according to any of claims 26 to 34 wherein the notification message comprises at least part of the text of the e-mail.

10 36. Apparatus according to any of claims 26 to 35 further comprising means for storing preferences selected by the subscriber.

37. Apparatus according to any of claims 26 to 36 wherein the apparatus is adapted to notify the subscriber of a selected number of e-mails.

15

38. Apparatus according to any of claims 26 to 37 wherein the apparatus is adapted to notify a subscriber of each e-mail received by the mail centre.

39. Apparatus according to any of claims 26 to 37 wherein the apparatus is  
20 adapted to notify a subscriber only of the first e-mail received by the mail centre since the subscriber last accessed the mail centre.

40. Apparatus according to any of claims 26 to 39 wherein the broadcast signal is a digital data stream.

25

41. Apparatus according to claim 40 further comprising means for compressing the digital data stream using a digital compression technique.

42. Apparatus according to claim 40 or 41 wherein the apparatus is adapted  
30 to send the notification message as a section of the digital data stream.

43. Apparatus according to claim 40 or 41 wherein the apparatus is adapted to send the notification message by way of an entitlement management message.

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44. Apparatus according to any of claims 26 to 43 wherein the broadcast signal comprises a television signal.

45. Apparatus according to any of claims 26 to 44 wherein the apparatus is adapted to push the notification message to the subscriber.

46. Apparatus for notifying a subscriber of the receipt of e-mail by a mail centre, which e-mail is to be transmitted to the subscriber via a first medium, comprising means for transmitting a notification message, indicating the receipt of e-mail by the mail centre, to the subscriber via a second medium, different from the first medium.

47. Apparatus according to claim 46 wherein the first medium is a switched medium and the second medium is a broadcast medium.

48. A receiver/decoder for receiving and/or decoding a broadcast signal, comprising means for receiving, together with a broadcast signal, a notification message for notifying a subscriber of the receipt of e-mail by a mail centre.

49. A receiver/decoder according to claim 48 wherein the receiver/decoder is adapted to compare an identifier in the notification message with an identifier which is stored at the receiver/decoder.

50. A receiver/decoder according to claim 48 or 49 wherein the receiver/decoder has a smartcard number and the identifier comprises at least part of the smartcard number.

51. A receiver/decoder according to any of claims 48 to 50 wherein the receiver/decoder generates a signal indicating the receipt of e-mail by the mail centre.

52. A receiver/decoder according to any of claims 48 to 51 wherein the receiver/decoder generates a signal for displaying at least part of the notification message.

53. A receiver/decoder for receiving and/or decoding a broadcast signal, comprising means for receiving e-mail via a first medium and means for receiving a

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notification message, indicating the receipt of e-mail by the mail centre, via a second medium different from the first medium.

54. A receiver/decoder according to claim 53 wherein the first medium is a  
5 switched medium and the second medium is a broadcast medium.

55. System for notifying a subscriber of the receipt of e-mail comprising apparatus according to any of claims 26 to 47 and a receiver/decoder according to any of claims 48 to 54.

10

56. An internet account management system for use with a broadcast system.

57. An internet account management system according to claim 56 comprising means, such preferably as a store, for storing information relating to e-mail accounts.

15

58. An internet account management system according to claim 56 or 57 wherein information relating to e-mail accounts is linked to identifiers of receiver/decoders.

20 59. An internet account management system according to claim 58 wherein the information relating to e-mail accounts is linked to the smartcard numbers of receiver/decoders.

25 60. A broadcast system including an internet account management system according to any of claims 56 to 59.

61. A broadcast system according to claim 60, including a Subscriber Authorisation System which is at a separate location from the internet account management system.

30

62. A broadcast system according to claim 60 or 61, including a Subscriber Management System.

63. A broadcast system according to claim 62, wherein the Subscriber

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Management System is at the same location as the internet account management system.

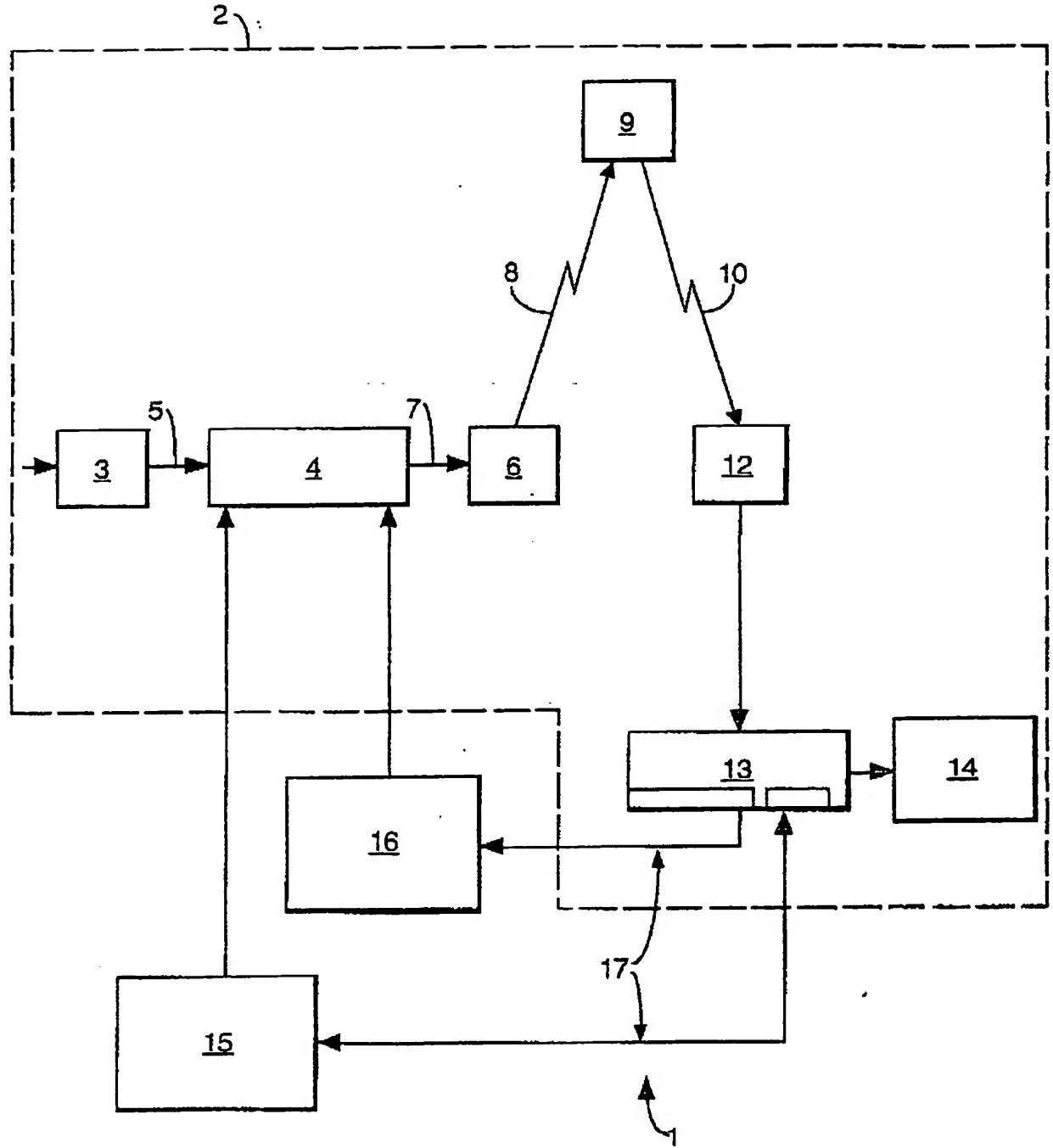
64. A broadcast system according to claim 62 or 63 as dependent on claim 61, wherein the internet account management system is coupled to the Subscriber Management System but not to the Subscriber Authorisation System.

65. A broadcast system according to claim 62, 63 or 64, further comprising an Internet Service Provider, wherein the Subscriber Management System is adapted to store subscriber information including subscriber smartcard numbers, and the subscriber smartcard numbers are not passed to the Internet Service Provider.

66. A broadcast system comprising a Subscriber Management System for storing subscriber information including subscriber smartcard numbers, and an Internet Service Provider, wherein the subscriber smartcard numbers are not passed to the Internet Service Provider.

1/6

Fig.1.



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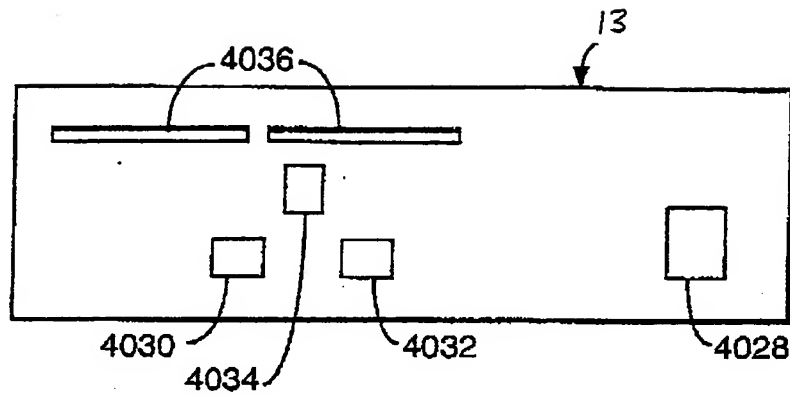


Fig. 2



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Fig.3

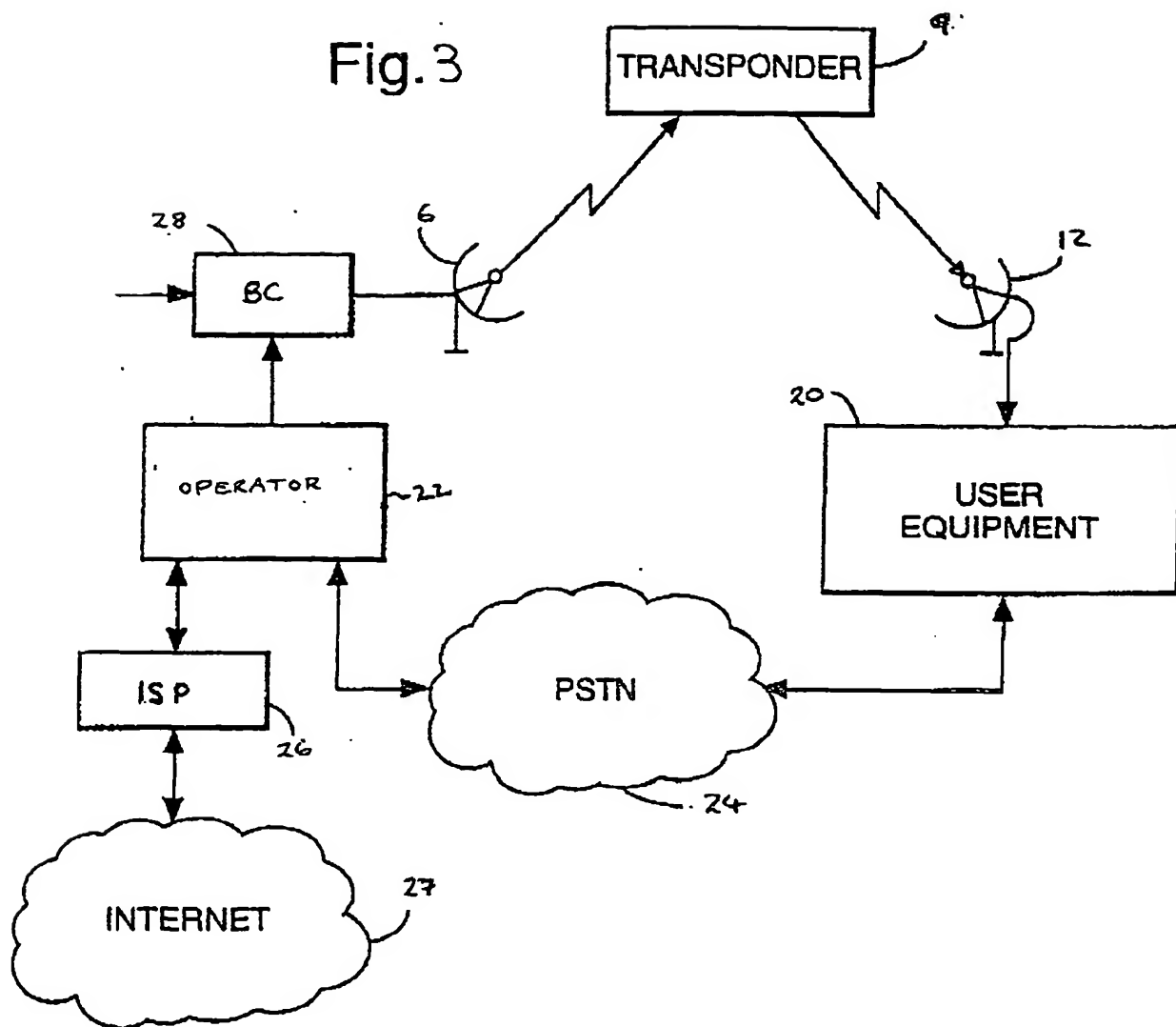
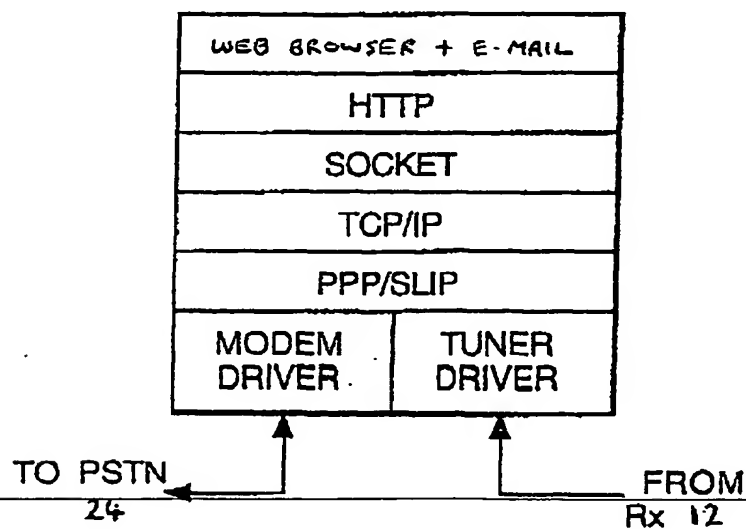
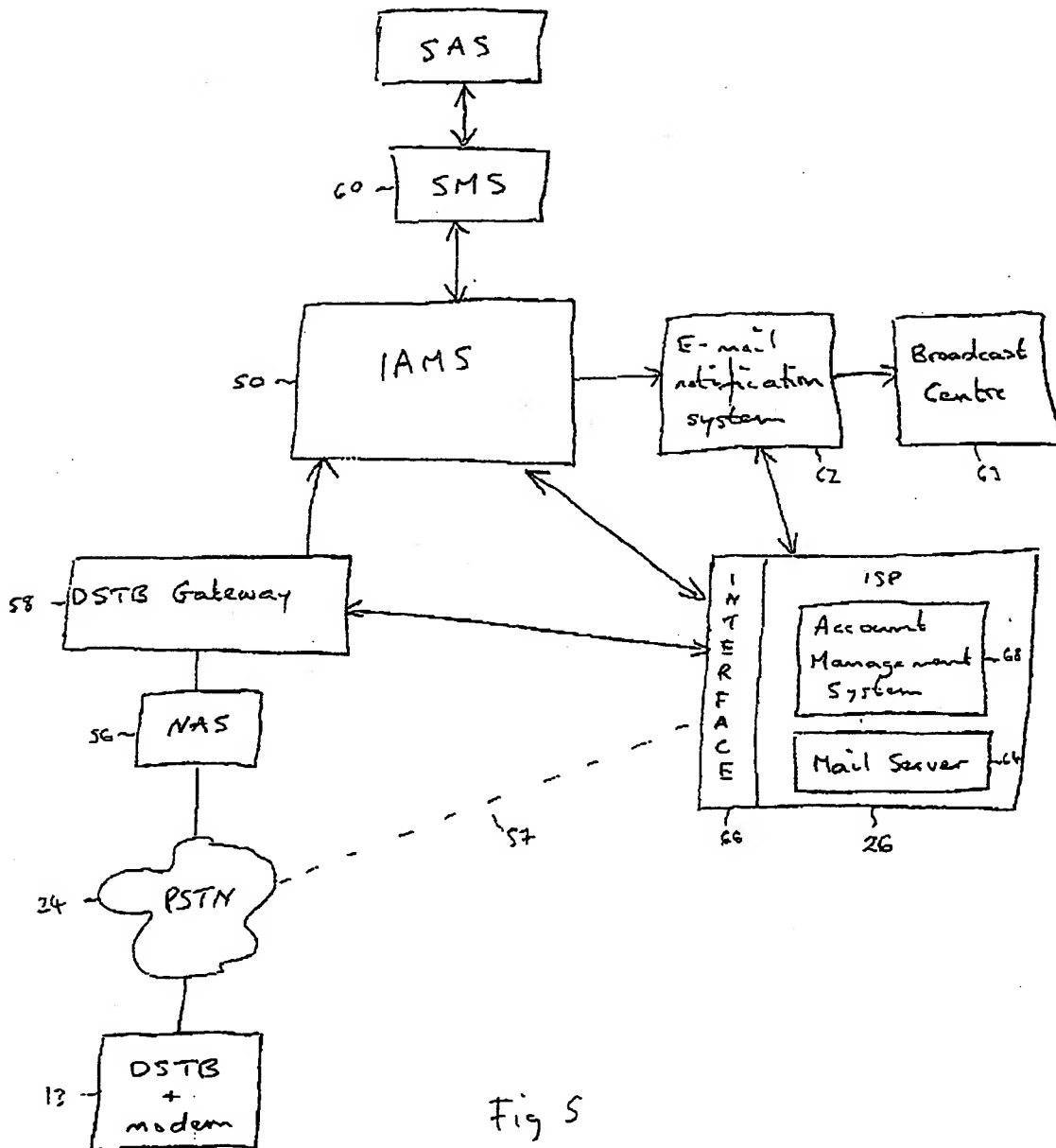


Fig. 4



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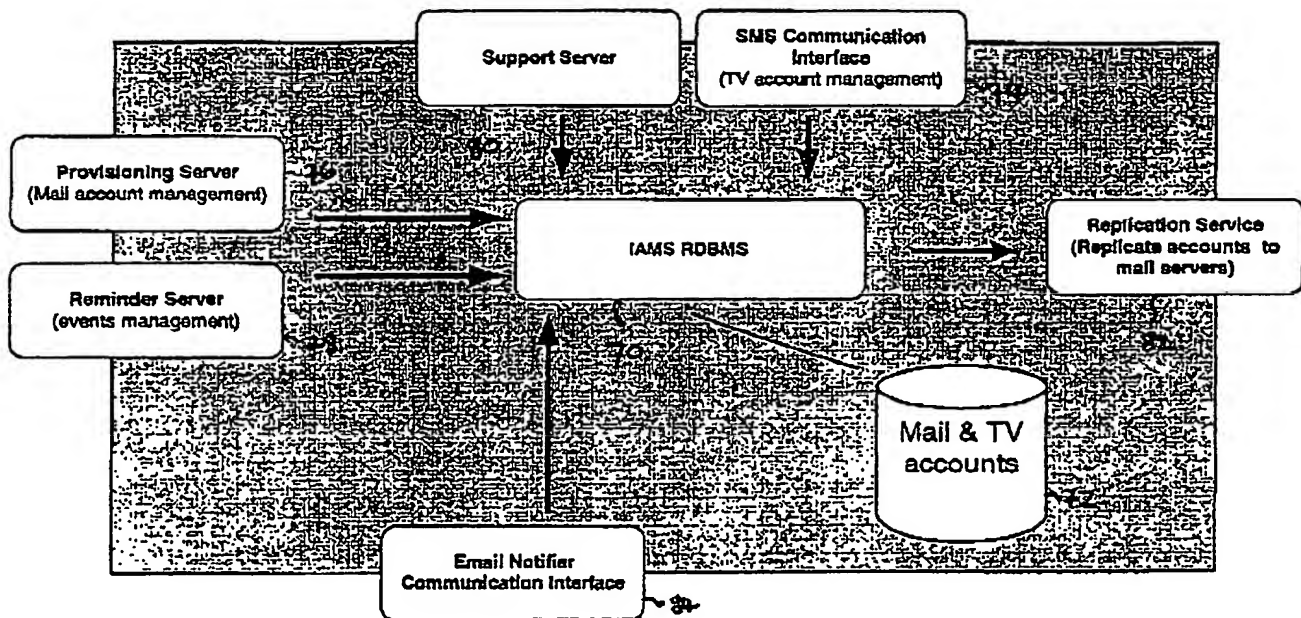
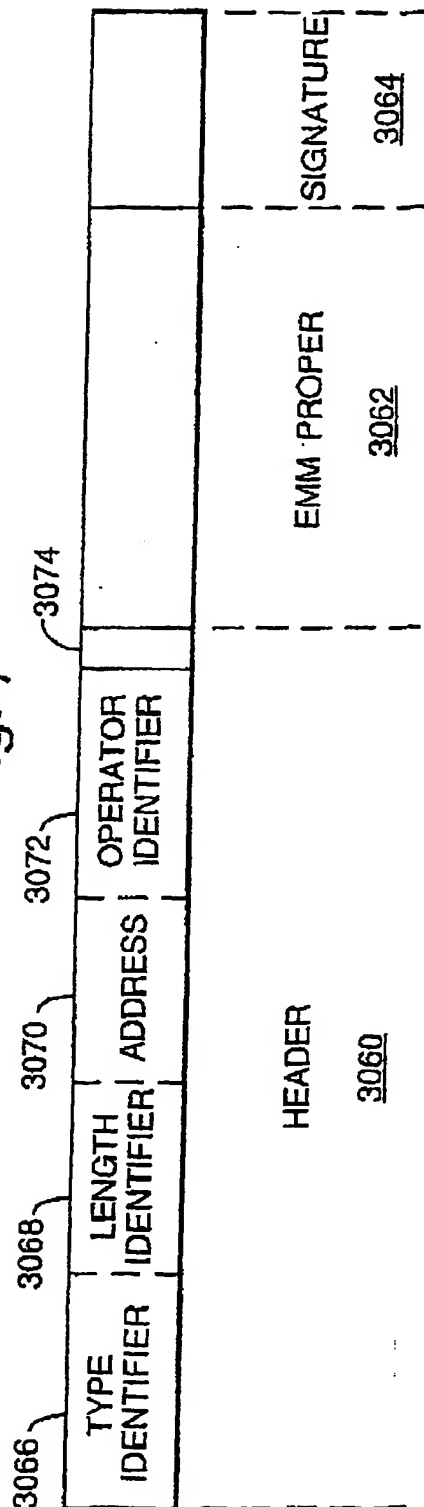


Fig. 6

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Fig. 7



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4

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The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

Patentanmeldung Nr. Patent application No. Demande de brevet n°

99401958.6

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Anmeldung Nr.:  
Application no.:  
Demande n°: **99401958.6**

Anmeldetag:  
Date of filing:  
Date de dépôt: **30/07/99**

Anmelder:  
Applicant(s):  
Demandeur(s):  
**CANAL+ Société Anonyme**  
**75711 Paris Cedex 15**  
**FRANCE**

Bezeichnung der Erfindung:  
Title of the invention:  
Titre de l'invention:

**Method and apparatus for transmitting and receiving messages, in particular in broadcast transmissions**

In Anspruch genommene Priorität(en) / Priority(ies) claimed / Priorité(s) revendiquée(s)

Staat: **EP**  
State:  
Pays:

Tag: **05/07/99**  
Date:  
Date:

Aktenzeichen:  
File no.  
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International Patent classification:  
Classification internationale des brevets:

**H04H1/00, H04N7/167**

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Etats contractants désignés lors du dépôt:

Bemerkungen:  
Remarks:  
Remarques:

**See for original title page 1 of the description.**





## TRANSMITTING AND RECEIVING MESSAGES

The invention relates to methods of and apparatus for transmitting text messages, in particular in broadcast systems, such as for television, radio, cellular phone or other such  
5 systems.

Broadcast systems are used for transmitting signals, such as digital or analogue television signals, from a broadcast centre to a user, via a medium such as a satellite, cable or terrestrial broadcast link. Receiver/decoders at the user end are used for receiving and/or  
10 decoding the signals, typically for input to a television set. In the case of digital transmission, digital channels are encoded into a digital data stream at the transmitter end, and are decoded at the receiver end using a receiver/decoder, which may typically be either in a digital set-top box (DSTB) or in an integrated digital television. In the case of  
15 analogue transmission, a receiver/decoder may be provided at the user to convert the transmitted signals into a format for input to a television set.

In known broadcast systems, text messages may be sent along with a transmitted signal. A suitably equipped receiver/decoder extracts the text message from the transmitted signal for display on a television screen. Such messages are accessible by all users with suitably  
20 equipped receiver/decoders.

Known system for sending text messages tend to be inflexible.

In a first aspect of the present invention there is provided a method of broadcasting a  
25 message, wherein the message comprises a text portion and an identifier of a group of users for whom the message is intended.

In a related aspect there is provided a method of broadcasting a message, comprising:-  
generating a message comprising a text portion and an identifier of a group of  
30 users for whom the message is intended; and  
broadcasting said message.

The invention may provide the advantage that a message may be sent to a group of users without the need for the message to be sent individually to every user in that group. The

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invention may also provide the advantage that only users in the group may read the message, which can prevent messages being sent to users for whom they are not intended. This may provide a more efficient way of sending messages to a group of users.

- 5 The text portion is preferably a section of text, for example in the form of coded or uncoded ASCII characters, which text may be for display, for example, on a user's television screen; alternatively, for example in the case of a radio system, the text could be announced to the user.
- 10 The group of users may be a selected group, selected from the totality of users, and the method may include the step of selecting such group, and preferably deriving the identifier based on the selection.

- A group of users may comprise two or more users. The identifier may be an identifier of
- 15 a group having a particular characteristic. In this way, the message may be directed to those users having a certain characteristic. The characteristic may be selected from at least one of geographic area, customer category, subscription to a particular commercial offer, purchase of a particular product, and purchase of a particular session. As used herein, a commercial offer is preferably the right to view a channel or a number of
- 20 channels (known as a "bouquet"); a product is preferably a programme, or a set of programmes, to which a user has subscribed; and a session is preferably a time slot on a certain channel. It will be appreciated that the audience may be split into different customer categories, such as cinema, football, rugby, age, social category etc. The invention extends to any division of users that can be identified by the operator sending
- 25 the message.

- It may be desired to send messages to users having a particular combination of characteristics, and thus the message may include identifiers of a plurality of characteristics. The message may further include an operator portion defining how those
- 30 identifiers are to be combined. The operator portion may define at least one logical operator, such as AND, OR, NOT and/or XOR.

The message may include a type specifier specifying that the message is of a type which includes a text portion.

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The message may include a priority specifier for specifying the priority of the message. This may for example be used to vary the way in which the message is output to the user.

5 In a related aspect there is provided a method of receiving a message at a user's receiver/decoder, wherein the message comprises a text portion and an identifier of a group of users for whom the message is intended.

The method may further comprise determining whether the user is in said group of users. The determining step may comprise comparing the identifier to a stored identifier (preferably stored at the user's receiver/decoder). In this way a receiver/decoder may be  
10 able to determine whether or not the message is intended for the corresponding user.

The method may further comprise generating a signal for advising of receipt of the message; for example, an indication may be produced on a display of the receiver/decoder,  
15 or a message or icon may be displayed on the television screen. In this way a user may be advised of the receipt of a message without the message itself being announced.

The method may further comprise outputting a signal representative of the text portion; the signal may for example be a display signal for enabling the text to be displayed, for  
20 instance on a user's television set.

The step of outputting a signal representative of the text may be carried out in response to a request from the user, or it may be carried out without any (direct) user action.

25 For example, the method may further comprise outputting a signal representative of the text in response to a request from the user, if the message includes a priority specifier which specifies that the message has a low priority. The method may also further comprise outputting a signal representative of the text without any (direct) user action if the message includes a priority specifier which specifies that the message has a high  
30 priority. Thus, for example, if an urgent message such as a hurricane warning is to be sent, this message could be assigned a high priority and could be displayed directly on a user's television set as soon as the message is received by the user's receiver/decoder, whereas other messages might be assigned a lower priority and would only be displayed on the user's television set in response to a request from the user.

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Preferably the message includes an identifier of the message, and the method further comprises comparing the identifier with an identifier of a previously received message. If the comparison reveals that the received message has the same identifier as a previously received message, then preferably the most recently received message is discarded. In this way it may be ensured that a message is not processed more than once.

The message may take the form of an entitlement management message. This may provide a convenient way in which to send a message to a user, and may also provide the advantage that the message can be encrypted using existing encryption mechanisms to ensure the confidentiality of the message.

Entitlement management messages (EMMs) are normally linked to access control, and have a certain structure. It will be appreciated that a message may take the form, or be based on the structure of, an entitlement management message, although it may not necessarily be used for managing entitlement. In preferred embodiments of the invention, message EMM use filtering mechanisms for targeting users which are the same as for access control EMMs, but they are not ciphered or signed.

The above feature may be provided independently, and thus in a second aspect of the invention there is provided a method of transmitting a message having a text portion, the method comprising transmitting the message in the form of an entitlement management message.

Any feature of the first aspect may be applied to the second aspect.

In an apparatus aspect of the invention there is provided apparatus for generating a message for broadcast, comprising means (such as a message generator) for generating the message, the message comprising a text portion and an identifier of a group of users for whom the message is intended.

Preferably, means (such as a multiplexer) is provided for inserting the message into a signal for broadcast. Preferably also, means (such as a transmitter) is provided for broadcasting said message.

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The apparatus may further comprise means for selecting said group from the totality of users.

5 The identifier may be an identifier of a group having a particular characteristic. The characteristic may be selected from at least one of geographic area, customer category, subscription to a particular commercial offer, purchase of a particular product, and purchase of a particular session.

10 The message may include identifiers of a plurality of characteristics. The message may include an operator portion defining how those identifiers are to be combined.

15 The message may include a type specifier specifying that the message is of a type which includes a text portion. The message may include a priority specifier for specifying the priority of the message.

The apparatus may further comprise:

20 means for receiving a command identifier from a Subscriber Management System;  
means for storing a further command identifier; and  
means for comparing the command identifier with the further command identifier;  
wherein the means for generating a message is adapted to generate said message  
in dependence on the result of the comparison.

25 In a related apparatus aspect there is provided a receiver/decoder for a user comprising means (such as a receiver) for receiving a message comprising a text portion and an identifier of a group of users for whom the message is intended, and means (such as a suitably programmed processor) for determining whether the user is in said group of users.

30 The determining means may comprise means (such as a comparator) for comparing the identifier to a stored identifier. The receiver/decoder may comprise means (such as a store) for storing the stored identifier.

The receiver/decoder may further comprise means for generating a signal for advising of receipt of the message.

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The receiver/decoder may further comprise means for outputting a signal representative of the text portion. The receiver/decoder may be adapted to output a signal representative of the text in response to a request from the user, if the message includes a priority specifier which specifies that the message has a low priority. The receiver/decoder may  
5 be adapted to output a signal representative of the text without any (direct) user action if the message includes a priority specifier which specifies that the message has a high priority.

The receiver/decoder may further comprise means, such as a comparator, for comparing  
10 the identifier with an identifier of a previously received message.

The message may take the form of an entitlement management message.

The invention also provides a system comprising any of the above described apparatus and  
15 any of the above described receiver/decoders.

In a second apparatus aspect there is provided apparatus for transmitting a message having a text portion, the apparatus comprising means for transmitting the message in the form of an entitlement management message.  
20

In a related apparatus aspect there is provided a receiver/decoder comprising means for receiving an entitlement management message containing a text portion and means for outputting a signal representative of the text portion.

25 The invention also provides an entitlement management message comprising a text portion and an identifier of a group of users for whom the message is intended.

Method features may be applied to the apparatus and message aspects and *vice versa*.

30 The invention extends to methods and/or apparatus substantially as herein described with reference to the accompanying drawings.

Preferred features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, in which:-

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Figure 1 shows an overview of a typical digital television system;

Figure 2 shows an overview of a conditional access system;

Figure 3 shows the structure of an Entitlement Management Message (EMM);

Figure 4 shows the structure of a Subscriber Authorization System;

5 Figure 5 shows the structure of an Audience Mail Message command;

Figure 6 shows the structure of an Audience Mail Message EMM; and

Figure 7 shows the structure of part of a receiver/decoder.

### System Overview

10 An overview of a digital television system 1 is shown in Figure 1. The invention includes a mostly conventional digital television system 2 that uses the known MPEG-2 compression system to transmit compressed digital signals. In more detail, MPEG-2 compressor 3 in a broadcast centre receives a digital signal stream (typically a stream of video signals). The compressor 3 is connected to a multiplexer and scrambler 4 by  
15 linkage 5.

The multiplexer 4 receives a plurality of further input signals, assembles the transport stream and transmits compressed digital signals to a transmitter 6 of the broadcast centre via linkage 7, which can of course take a wide variety of forms including  
20 telecommunications links. The transmitter 6 transmits electromagnetic signals via uplink 8 towards a satellite transponder 9, where they are electronically processed and broadcast via notional downlink 10 to earth receiver 12, conventionally in the form of a dish owned or rented by the end user. Other transport channels for transmission of the data are of course possible, such as terrestrial broadcast, cable transmission,  
25 combined satellite/cable links, telephone networks etc.

The signals received by receiver 12 are transmitted to an integrated receiver/decoder 13 owned or rented by the end user and connected to the end user's television set 14. The receiver/decoder 13 decodes the compressed MPEG-2 signal into a television  
30 signal for the television set 14. Although a separate receiver/decoder is shown in Figure 1, the receiver/decoder may also be part of an integrated digital television. As used herein, the term "receiver/decoder" includes a separate receiver/decoder, such as a set-top box, and a television having a receiver/decoder integrated therewith.

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In a multichannel system, the multiplexer 4 handles audio and video information received from a number of parallel sources and interacts with the transmitter 6 to broadcast the information along a corresponding number of channels. In addition to audiovisual information, messages or applications or any other sort of digital data may  
5 be introduced in some or all of these channels interlaced with the transmitted digital audio and video information.

A conditional access system 15 is connected to the multiplexer 4 and the receiver/decoder 13, and is located partly in the broadcast centre and partly in the  
10 receiver/decoder. It enables the end user to access digital television broadcasts from one or more broadcast suppliers. A smartcard, capable of deciphering messages relating to commercial offers (that is, one or several television programmes sold by the broadcast supplier), can be inserted into the receiver/decoder 13. Using the receiver/decoder 13 and smartcard, the end user may purchase commercial offers in  
15 either a subscription mode or a pay-per-view mode.

As mentioned above, programmes transmitted by the system are scrambled at the multiplexer 4, the conditions and encryption keys applied to a given transmission being determined by the access control system 15. Transmission of scrambled data in this  
20 way is well known in the field of pay TV systems. Typically, scrambled data is transmitted together with a control word for descrambling of the data, the control word itself being encrypted by a so-called exploitation key and transmitted in encrypted form.

25 The scrambled data and encrypted control word are then received by the receiver/decoder 13 having access to an equivalent to the exploitation key stored on a smart card inserted in the receiver/decoder to decrypt the encrypted control word and thereafter descramble the transmitted data. A paid-up subscriber will receive, for example, in a broadcast monthly EMM (Entitlement Management Message) the  
30 exploitation key necessary to decrypt the encrypted control word so as to permit viewing of the transmission.

An interactive system 16, also connected to the multiplexer 4 and the receiver/decoder



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13 and again located partly in the broadcast centre and partly in the receiver/decoder, enables the end user to interact with various applications via a modemmed back channel 17. The modemmed back channel may also be used for communications used in the conditional access system 15.

5

### Conditional Access System

With reference to Figure 2, in overview the conditional access system 15 includes a Subscriber Authorization System (SAS) 30. The SAS 30 is connected to one or more Subscriber Management Systems (SMS) 32, one SMS for each broadcast supplier, by a link 34, which may be a TCP-IP link or other type of link. Alternatively, one SMS could be shared between two commercial operators, or one operator could use two SMSs, and so on.

First encrypting units in the form of ciphering units 36 utilising "mother" smartcards 38 are connected to the SAS by linkage 40. Second encrypting units again in the form of ciphering units 42 utilising mother smartcards 44 are connected to the multiplexer 4 by linkage 46. The receiver/decoder 13 receives a "daughter" smartcard 48. The receiver/decoder is connected directly to the SAS 30 via Communications Servers 50 and the modemmed back channel 17. The SAS sends amongst other things subscription rights to the daughter smartcard on request.

The smartcards contain confidential information from one or more commercial operators. The "mother" smartcard encrypts different kinds of messages and the "daughter" smartcards decrypt the messages, if they have the rights to do so.

25

With reference to Figure 2, in the broadcast centre, the digital video signal is first compressed (or bit rate reduced), using the MPEG-2 compressor 3. This compressed signal is then transmitted to the multiplexer and scrambler 4 in order to be multiplexed with other data, such as other compressed data.

30

The scrambler generates a control word used in the scrambling process and included in the MPEG-2 stream in the multiplexer 4. The control word is generated internally and enables the end user's integrated receiver/decoder 13 to descramble the programme.

- 10 -

Access criteria, indicating how the programme is commercialised, are also added to the MPEG-2 stream. The programme may be commercialised in either one of a number of "subscription" modes and/or one of a number of "Pay Per View" (PPV) modes or events. In the subscription mode, the end user subscribes to one or more commercial offers, or

5 "bouquets", thus getting the rights to watch every channel inside those bouquets. In the Pay Per View mode, the end user is provided with the capability to purchase events as he wishes.

Both the control word and the access criteria are used to build an Entitlement Control

10 Message (ECM); this is a message sent in relation with one scrambled program; the message contains a control word (which allows for the descrambling of the program) and the access criteria of the broadcast program. The access criteria and control word are transmitted to the second encrypting unit 42 via the linkage 46. In this unit, an ECM is generated, encrypted and transmitted on to the multiplexer and scrambler 4.

15

Each service broadcast by a broadcast supplier in a data stream comprises a number of distinct components; for example a television programme includes a video component, an audio component, a sub-title component and so on. Each of these components of a service is individually scrambled and encrypted for subsequent broadcast. In respect of

20 each scrambled component of the service, a separate ECM is required.

The multiplexer 4 receives electrical signals comprising encrypted EMMs from the SAS 30, encrypted ECMs from the second encrypting unit 42 and compressed programmes from the compressor 3. The multiplexer 4 scrambles the programmes and transmits the

25 scrambled programmes, the encrypted EMMs and the encrypted ECMs as electric signals to broadcast system 54, which may be for example a satellite system as shown in Figure 1, or other broadcast system. The receiver/decoder 13 demultiplexes the signals to obtain scrambled programmes with encrypted EMMs and encrypted ECMs.

30 The receiver/decoder receives the broadcast signal and extracts the MPEG-2 data stream. If a programme is scrambled, the receiver/decoder 13 extracts the corresponding ECM from the MPEG-2 stream and passes the ECM to the "daughter" smartcard 48 of the end user. This slots into a housing in the receiver/decoder 13. The daughter smartcard 48 controls whether the end user has the right to decrypt the ECM and to access the

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programme. If not, a negative status is passed to the receiver/decoder 13 to indicate that the programme cannot be descrambled. If the end user does have the rights, the ECM is decrypted and the control word extracted. The decoder 13 can then descramble the programme using this control word. The MPEG-2 stream is decompressed and translated  
5 into a video signal for onward transmission to television set 14.

If the programme is not scrambled, no ECM will have been transmitted with the MPEG-2 stream and the receiver/decoder 13 decompresses the data and transforms the signal into a video signal for transmission to television set 14.

10

The Subscriber Management System (SMS) 30 includes a database 52 which manages, amongst others, all of the end user files, commercial offers (such as tariffs and promotions), subscriptions, PPV details, and data regarding end user consumption and authorization. The SMS may be physically remote from the SAS.

15

The SMS 32 transmits messages to the SAS 30 which imply modifications to or creations of Entitlement Management Messages (EMMs) to be transmitted to end users. The SMS 32 also transmits messages to the SAS 30 which imply no modifications or creations of EMMs but imply only a change in an end user's state (relating to the authorization granted  
20 to the end user when ordering products or to the amount that the end user will be charged). The SAS 30 also sends messages (typically requesting information such as call-back information or billing information) to the SMS 32, so that it will be apparent that communication between the two is two-way.

## 25 Entitlement Management Messages (EMMs)

The EMM is a message dedicated to an individual end user (subscriber), or a group of end users, only, in contrast with an ECM, which is dedicated to one scrambled programme only or a set of scrambled programmes if part of the same commercial offer.

30 Various specific types of EMM are possible. Individual EMMs are dedicated to individual subscribers, and are typically used in the provision of Pay Per View services; these contain the group identifier and the position of the subscriber in that group. So-called "Group" subscription EMMs are dedicated to groups of, say, 256 individual users, and are typically used in the administration of some subscription services. Audience EMMs are dedicated

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to entire audiences. An "audience" is the totality of subscribers having smartcards which bear the same Operator Identifier (OI). Finally, a "unique" EMM is addressed to the unique identifier of the smartcard.

- 5 In preferred embodiments, audience EMMs are used to convey messages to specific groups of users.

The general form of an EMM which is used in the preferred embodiments is now described with reference to Figure 3. Basically, the EMM, which is implemented as a series of digital data bits, comprises a header 60, the EMM proper 62, and a signature 64.  
10 The header 60 in turn comprises a type identifier 66 to identify the type of EMM, a length identifier 68 which gives the length of the EMM, an optional address 70 for the EMM, an operator identifier 72 and a key identifier 74. Finally, the signature 64, which is also optional, provides a number of checks against corruption of the remaining data in the  
15 EMM. The type identifier in the header identifies the message as an EMM.

#### Subscriber Authorization System (SAS)

Messages generated by the SMS 32 are passed via linkage 34 to the Subscriber Authorization System (SAS) 30, which in turn generates messages acknowledging receipt  
20 of the messages generated by the SMS 32 and passes these acknowledgements to the SMS 32. Messages which may be passed to the SAS include subscriber suspension, for example, due to non-payment, subscriber modification, for example to add or remove certain commercial offers, and provide rights, for example for a specific event in PPV mode.

25 The SAS 30 manages databases that store the status of all subscribers declared by the SMS 32. According to the status and the various messages sent by the SMS, the SAS generates EMMs for the subscribers' smartcards. The EMMs are ciphered by the SAS cyphering units 36 and sent to the multiplexer 4. To ensure that the EMMs are received  
30 by the subscriber, the SAS sends these messages cyclically. The cycle depends on the type of EMM, but is typically between 30 seconds and 30 minutes.

A typical configuration of the SAS 30 is shown in Figure 4. In overview the SAS 30 comprises a Subscription Chain area 100 to give rights for subscription mode and to

renew the rights automatically each month, a Pay Per View (PPV) Chain area 102 to give rights for PPV events, and an EMM Injector 104 for passing EMMs created by the Subscription and PPV chain areas to the multiplexer and scrambler 4, and hence to feed the MPEG stream with EMMs. If other rights are to be granted, such as Pay Per File (PPF) rights in the case of downloading computer software to a user's Personal Computer, other similar areas are also provided.

One function of the SAS 30 is to manage the access rights to television programmes, available as commercial offers in subscription mode or sold as PPV events according to different modes of commercialisation (pre-book mode, impulse mode). The SAS 30, according to those rights and to information received from the SMS 32, generates EMMs for the subscriber.

The Subscription Chain area 100 comprises a Command Interface (CI) 106, a Subscriber Technical Management (STM) server 108, a Message Generator (MG) 110, and the Ciphering Unit 36. The PPV Chain area 102 comprises an Authorisation Server (AS) 112, Database Servers 114, 116 which contain relational databases for storing relevant details of the end users, Order Centralized Server (OCS) 118, a Server for Programme Broadcaster (SPB) 120, a Message Generator (MG) 122 whose function is basically the same as that for the Subscription Chain area, and Ciphering Unit 36.

The EMM Injector 104 comprises a plurality of Message Emitters (MEs) 124, 126, 128 and 130 and Software Multiplexers (SMUXs) 132 and 134. In the preferred embodiment, there are two MEs, 124 and 126 for the Message Generator 132, with the other two MEs 128 and 130 for the Message Generator 134. MEs 124 and 126 are connected to the SMUX 132 whilst MEs 128 and 130 are connected to the SMUX 134.

The Message Generators 110 and 122 transform commands issued by the STM 108 and the OCS 118, respectively, into EMMs. The MGs determine the duration and the rate of emission of the EMMs. The MGs also cipher the EMMs using a dedicated ciphering unit. They then pass the ciphered EMM to the respective MEs, which transmit the EMMs cyclically. As shown in Figure 4, more than one ME can be connected to a single MG, the appropriate ME being determined by the MG according to the operator referred to in the EMM. During the lifetime of a given EMM, the MG stores it inside its own database.

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The EMM is erased from the database as soon as its emission duration has expired. This database ensures consistency between the MG and ME.

The Message Emitters 124, 126, 128, 130 receive EMMs from the respective MGs along with several parameters, such as broadcast start date, broadcast stop date, and broadcast cycle. The MGs then manage the broadcast of the EMMs according to the specified parameters.

#### Mail Messages

10 The present broadcasting system 1 is adapted to send mail messages, typically in the form of an ASCII string, from the commercial operator (broadcast supplier) at the SMS to a user's receiver/decoder. Mail messages generally consist of text messages which are intended for display on a users television set. Mail messages may be sent in the form of a particular type of EMM, or by other means. In the present embodiment so-called  
15 Audience Mail Messages are used to convey mail messages to particular groups of subscribers.

Audience Mail Messages allow a commercial operator to send a message to all users in a particular group, without the need to address each user in the group individually. This  
20 can optimise the bandwidth used for transmitting messages, since few messages need be transmitted.

The users to whom an Audience Mail Message is addressed may be selected depending on one or more parameters. Examples of such parameters are as follows:

- 25 - Geographic zone. The message is only available to users within the specified geographic zone.
- Customer category. The message is only available to users having a specified customer category such as cinema, football, rugby, age, etc.
- Commercial offer. The message is only available to subscribers to the specified  
30 commercial offer.
- Session number. The message is only available to users who have access to the specified session.
- Product number. The message is only available to users to a particular product.

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In this way, messages intended for certain groups of users may be directed to users within that group but not to other users. For example, a bad weather warning may be directed to users within a specific geographic zone, or people who subscribed to a particular film (with an associated product number) could be informed that the sequel to that film will be broadcast, or people who subscribe to a particular channel (as part of a commercial offer), such as a wildlife channel could be informed that a particular wildlife programme is about to begin.

In order to send an Audience Mail Message, the operator sends an Audience Mail Message command from the SMS 32 to the SAS 30. Referring to Figure 5, Audience Mail Message command 150 comprises a command identifier 152, which identifies the command as an Audience Mail Message command, operator identifier 154, which identifies the operator, one or more identifiers 156 which specify the group of users for whom the mail message is intended, a priority field 158, and the text message 160 in the form of an ASCII string.

In a preferred embodiment the group addressed depends on one of more of at least geographic area, customer category, commercial offer, session number and product number. Depending on the implementation, only one identifiers may be used with any one mail message, or a plurality of identifiers may be used. In the latter case, the plurality of identifiers may be combined using logical operators such as AND, OR, XOR and/or NOT, as specified in the command.

Use of logical operators enables several criteria to be used to target specific groups of users. As an example, several geographic may zones exist, Marseille being one of them, and Paris another, and the audience may have been split into difference customer categories, such as cinema, football, rugby etc. If the product reference for a specific football match between Marseille and Paris is 1234, then a message could be sent to fans of the two clubs who have not yet purchased the match, advising them of the match, by using the following combination:

(Geographical\_Zone = Marseille OR Geographical\_Zone = Paris) AND Customer\_Category = Football AND NOT Product = 1234

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In certain implementations parentheses may not be available, in which case two messages could be sent to groups of users using the following combinations:

Geographical\_Zone = Marseille AND Customer\_Category = Football AND NOT Product = 1234

5

Geographical\_Zone = Paris) AND Customer\_Category = Football AND NOT Product = 1234

In either case, the logical operators which are to be used are defined by the operator and included in parameters 156 in command 150 from the SMS 32 to the SAS 30.

10

The priority field 158 specifies the priority of the message. If the priority field is left blank, the message is assigned a normal priority.

When the SAS receives an Audience Mail Message command it constructs a special EMM in order to transmit the message to the user. Referring again to Figure 4, the command sent from the SMS is received by the Command Interface (CI) 106 and passed to the Subscriber Technical Management (STM) server 108. The STM server 108 identifies the command as an Audience Mail Message command. It then sends a command to the Message Generator (MG) to generate an Audience Mail Message EMM.

20

The Message Generator (MG) 110 generates an Audience Mail Message in the form of an EMM on receiving the command from the STM server 108. The structure of the Audience Mail Message EMM is shown in Figure 6. Referring to Figure 6, the EMM 200 comprises a header 202, EMM proper 208, and, optionally, signature 226. Header 202 contains a type identifier 204 and an operator identifier 206 as well as other information as described above with reference to Figure 3. The type identifier identifies the EMM as a group EMM, that is, as specific to a group of users.

The EMM proper 208 comprises an identifier 210 which identifies the EMM as an Audience Mail Message EMM, a number of identifiers 212, 214, 216, 218 which specify the group to which the EMM is addressed, a logical operator field 220 which specifies one or more logical operator, a priority specifier 222, index 224, and the text message 226.

30

In a preferred embodiment, each identifier 212, 214, 216, 218 comprises two parts, the



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first part specifying which characteristic that identifier relates to, and the second specifying the value. In an alternative embodiment, each characteristic is allocated a particular part of the EMM, in which case each identifier merely comprises a value.

- 5 Referring to Figure 6, in a particular example, identifier 212, which is two bytes long, specifies a commercial offer; identifier 214, which is also two bytes long, specifies a geographic zone; identifier 216, which is three bytes long, specifies a session number; and identifier 218, which is three bytes long, specifies a product number. In any particular EMM, one or more of the above identifiers may be missing; for example, a simple  
10 implementation may include a single identifier having a first part specifying which characteristic that identifier relates to, and a second part specifying the value.

- Logical operator field 220 specifies one or more logical operator, such as AND, OR, XOR and/or NOT that is to be applied to the identifiers 212, 214, 216 and 218, as  
15 specified in the command 150 from the SMS 32 to the SAS 30. The priority specifier 222 takes a value depending on the priority of the message, as specified by the operator in the command from the SMS to the SAS. Index 224 takes a value which is specific to that particular EMM, so that that EMM can be identified. Mail message 226, which is typically 89 bytes long, contains the actual text message, in the form of an ASCII string,  
20 which is to be conveyed to the user.

- The MG 110 also determines the broadcast start and stop time and cycle rate of the EMM. The length of time for which a EMM is to be broadcast and the cycle rate are generally set to a certain value for Audience Mail Message EMMs, but they might be  
25 altered, for example, in dependence on the priority of the message (as specified by the operator) or the global bitrate of the broadcast signal.

- Once the EMM has been generated, it is optionally ciphered using Ciphering Unit 36. The EMM may be ciphered, for example, if it is desired to keep the mail message confidential.  
30

The EMM, together with the broadcast start and stop time and cycle rate, are then passed to the EMM injector 104. The EMM injector is responsible for inserting the EMM into the broadcast data stream at the appropriate times, in dependence on the broadcast start and stop time and cycle rate. The EMM is stored in a database at the Message Emitter

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(ME) 124 or 126. The EMM is inserted into the broadcast data stream by the appropriate software multiplexer (SMUX) 132 or 134, and multiplexer 4. The EMM is then transmitted in the broadcast signal for reception by the receiver/decoder 13.

- 5 Referring to Figure 7, receiver/decoder 13 comprises tuner 250 and demodulator 252 for receiving and demodulating, respectively, the broadcast signal. The demodulated signal is passed to demultiplexer 254, which separates the various components of the signal. Audio signals are passed to audio processor 256, video signals are passed to video processor 258, and EMMs are passed to central processing unit (CPU) 260 and stored in
- 10 a buffer. EMMs which are ciphered are deciphered by a deciphering unit 266 in the receiver/decoder.

- A program, called a mail application, which is run on the CPU, allows the user to access Audience Mail Messages. The mail application extracts the various identifiers which
- 15 specify the group of users for whom the message is intended. Stored in the CPU memory are various user identifiers, such as geographic zone and customer category of the user, and commercial offers, products and sessions which the user has purchased. The mail application compares the identifiers extracted from the EMM to the corresponding user identifiers. Where logical operators are included in the logical operator field 220 of the
- 20 EMM, the application extracts the logical operators and applies them to the identifiers. In this way, the application is able to determine whether the user is one of the users for whom the Audience Mail Message is intended.

- Taking the above example of a football match between Marseille and Paris, the application
- 25 would check whether the geographic zone of the subscriber was Marseille or Paris, whether the customer category was (or included) football, and whether the user had not purchased product number 1234.

- If the mail application decides that the user does not fulfill the criteria, then it removes the
- 30 EMM from the buffer, and takes no further action. If the application decides that it does fulfill the criteria, then it extracts the mail message 226 from the EMM and stores it in a mail message buffer ("mailbox") in the CPU memory. The application then indicates to the user that there is mail waiting. This may be done either by producing an indication on the receiver/decoder display, or by displaying a message or icon on the television screen.

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In the latter case, graphic processor 264 is responsible for combining the message or icon with the video image.

Once the user has been informed that mail is waiting, he can access his mailbox and display the message on the screen. The mail application is responsible for extracting the text of the message from the Audience Mail Message EMM and displaying it on the user's television screen, via graphic processor 264, in response to a request from the user.

In some circumstances, for example, if the message has been assigned a high priority, the message is displayed directly on the television screen without the user taking any action. For example, in the case of a storm warning, the message may be assigned a high priority, and the receiver/decoder would then display the message directly on the television screen.

Finally, when the receiver/decoder has received a mail EMM, it "burns" the EMM, so that the message is not repeatedly displayed. This is done by comparing incoming mail EMMs to ones that have already been received, by using the index 224 in the EMM. Incoming EMMs which have the same index as EMMs which have already been received, are removed from the buffer.

To summarise, the commercial operator can send a message (ASCII string) to a group of subscribers. In order to do so, the DSTB contains a number of internal buffers in which it can store these messages. When the DSTB receives such a message, it instructs the subscriber (via a message on the TV set, for example) to consult his "mailbox". The viewer then uses specific menus to display these messages on the TV screen.

25

A specific command is used to allow the SMS to send such messages. The command contains the following information:

- The unique smartcard identifier
- The message itself, in the form of an ASCII string
- 30 • Optionally, the priority of the message (Normal or Urgent). If the priority is omitted, the message has normal priority.

The group addressed depends on optional parameters:

- No additional parameters - All the operator's smartcards are addressed.

- 20 -

- Commercial offer - Only smartcards possessing the commercial offer store the message
- Geographic zone - Only smartcards having the specified geographical zone number store the message.
- 5 • Session number - Only smartcards possessing the session number store the message.

In one embodiment, only one of the methods used to select the group to be addressed can be used for any one message.

10

It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

Each feature disclosed in the description, and (where appropriate) the claims and  
15 drawings may be provided independently or in any appropriate combination.

Reference numerals appearing in the claims are by way of illustration only and shall have no limiting effect on the scope of the claims.

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## CLAIMS

1. A method of broadcasting a message, wherein the message comprises a text portion and an identifier of a group of users for whom the message is intended.

5

2. A method of broadcasting a message, comprising:-  
generating a message comprising a text portion and an identifier of a group of users for whom the message is intended; and  
broadcasting said message.

10

3. A method according to claim 1 or 2 further comprising selecting said group from the totality of users.

4. A method according to any of the preceding claims wherein the identifier is an identifier of a group having a particular characteristic.

15

5. A method according to claim 4 wherein the characteristic is selected from at least one of geographic area, customer category, subscription to a particular commercial offer, purchase of a particular product, and purchase of a particular session.

20

6. A method according to any of the preceding claims wherein the message includes identifiers of a plurality of characteristics.

7. A method according to claim 6 wherein the message includes an operator portion defining how those identifiers are to be combined.

25

8. A method according to any of the preceding claims wherein the message includes a type specifier specifying that the message is of a type which includes a text portion.

30

9. A method according to any of the preceding claims wherein the message includes a priority specifier for specifying the priority of the message.

10. A method of receiving a message at a user's receiver/decoder, wherein the

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message comprises a text portion and an identifier of a group of users for whom the message is intended.

11. A method according to claim 10, the method further comprising  
5 determining whether the user is in said group of users.

12. A method according to claim 11 wherein the determining step comprises comparing the identifier to a stored identifier.

10 13. A method according to claim 11 or 12 further comprising generating a signal for advising of receipt of the message.

14. A method according to any of claims 11 to 13 further comprising  
15 outputting a signal representative of the text portion.

15. A method according to any of claims 11 to 14 further comprising outputting a signal representative of the text in response to a request from the user, if the message includes a priority specifier which specifies that the message has a low priority.

20 16. A method according to any of claims 11 to 15 further comprising outputting a signal representative of the text without any user action if the message includes a priority specifier which specifies that the message has a high priority.

17. A method according to any of claims 11 to 16 wherein said message  
25 includes an identifier of the message, the method further comprising comparing the identifier with an identifier of a previously received message.

18. A method according to any of the preceding claims wherein the message  
30 takes the form of an entitlement management message.

19. A method of transmitting a message having a text portion, the method comprising transmitting the message in the form of an entitlement management message.

20. Apparatus for generating a message for broadcast, comprising means for

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generating the message, the message comprising a text portion and an identifier of a group of users for whom the message is intended.

21. A receiver/decoder for a user, comprising means for receiving a message  
5 comprising a text portion and an identifier of a group of users for whom the message is intended, and means for determining whether the user is in said group of users.

22. A system comprising apparatus according to claim 20 and receiver/decoder  
according to claim 21.

10

23. Apparatus for transmitting a message having a text portion, the apparatus  
comprising means for transmitting the message in the form of an entitlement management  
message.

15 24. Receiver/decoder comprising means for receiving an entitlement  
management message containing a text portion and means for outputting a signal  
representative of the text portion.

25. An entitlement management message comprising a text portion and an  
20 identifier of a group of users for whom the message is intended.

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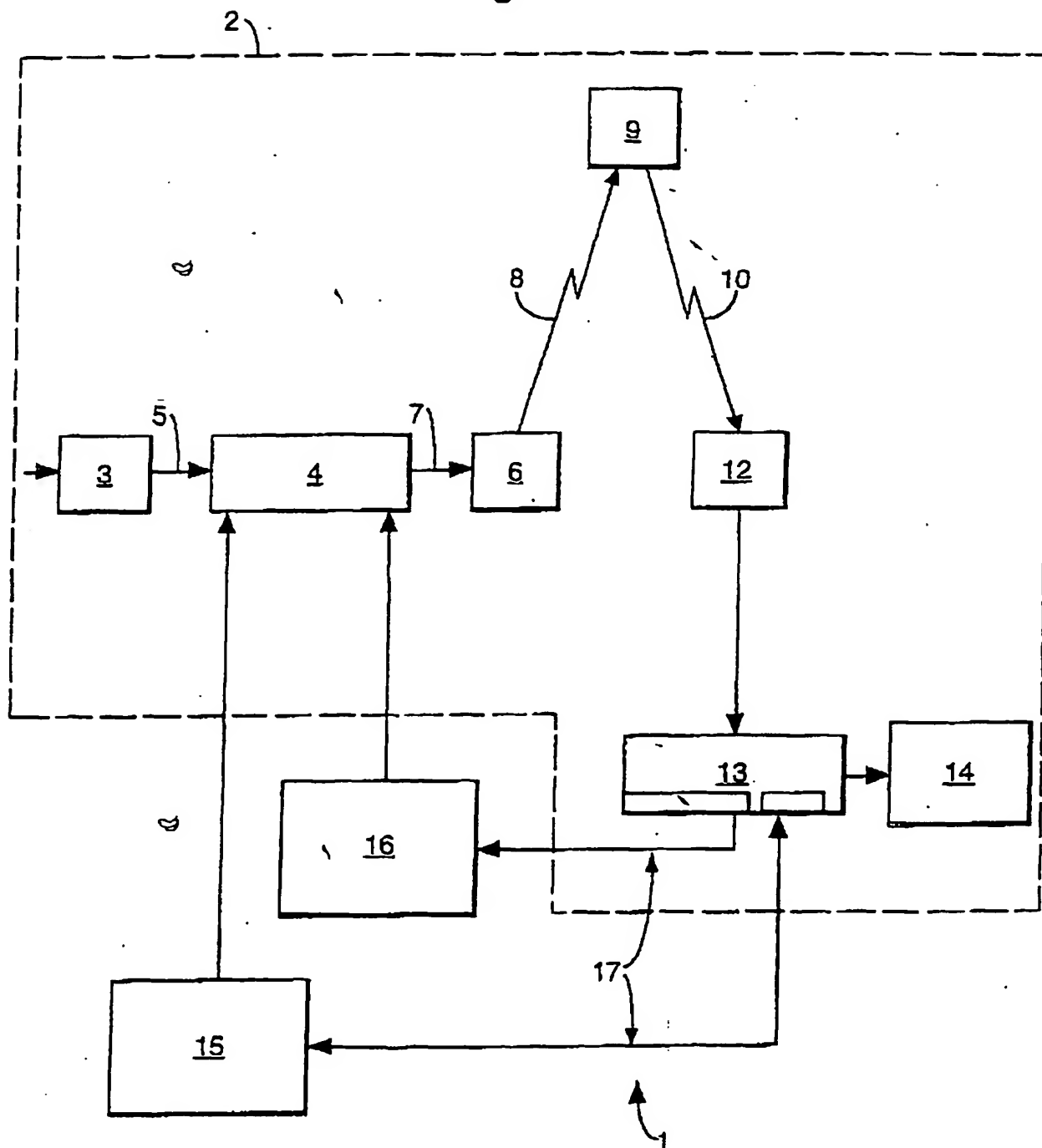
**ABSTRACT****TRANSMITTING AND RECEIVING MESSAGES**

- 5 The present invention provides apparatus for generating a message for broadcast, comprising means (such as a message generator) for generating the message, the message comprising a text portion and an identifier of a group of users for whom the message is intended.
- 10 (Figure 6)



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Fig.1.



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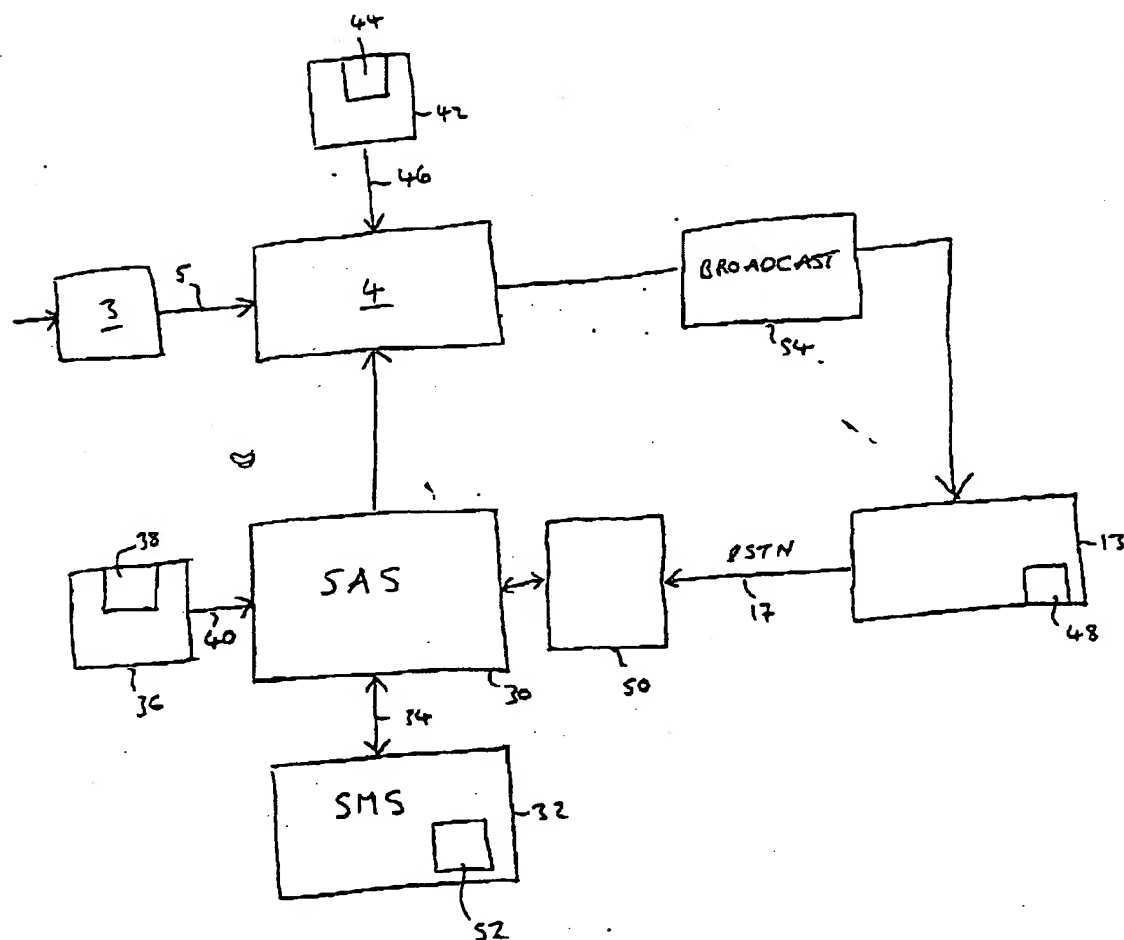
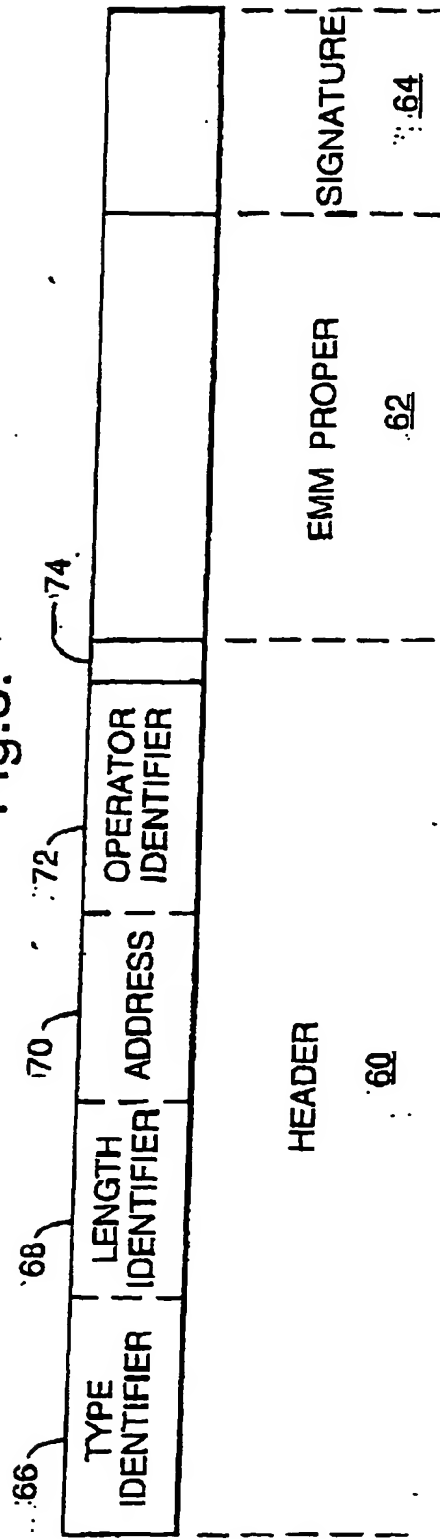


Fig. 2

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Fig.3.



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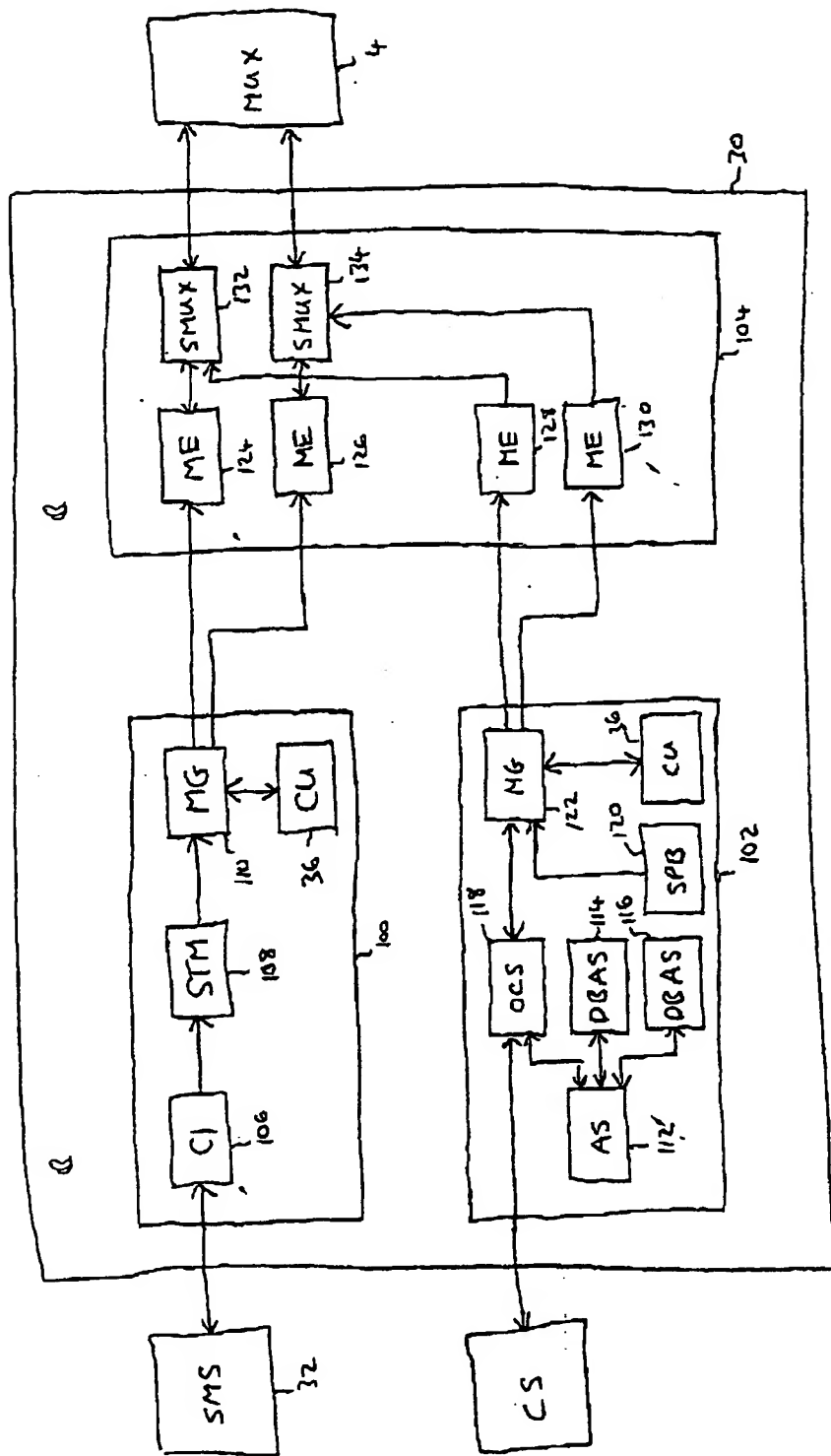


Fig. 4

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150  
↓  
151

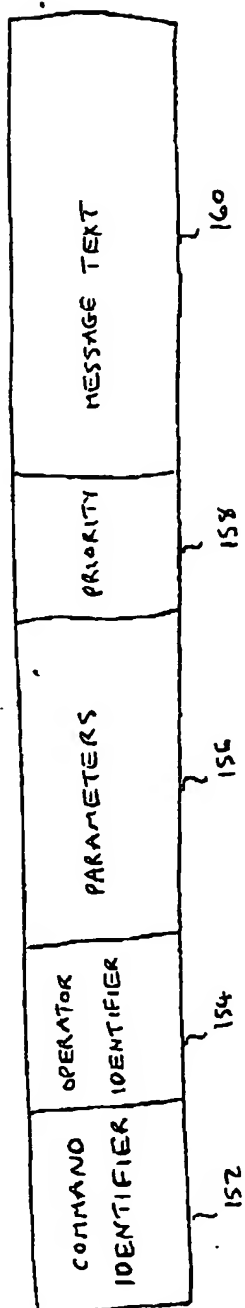


Fig. 5

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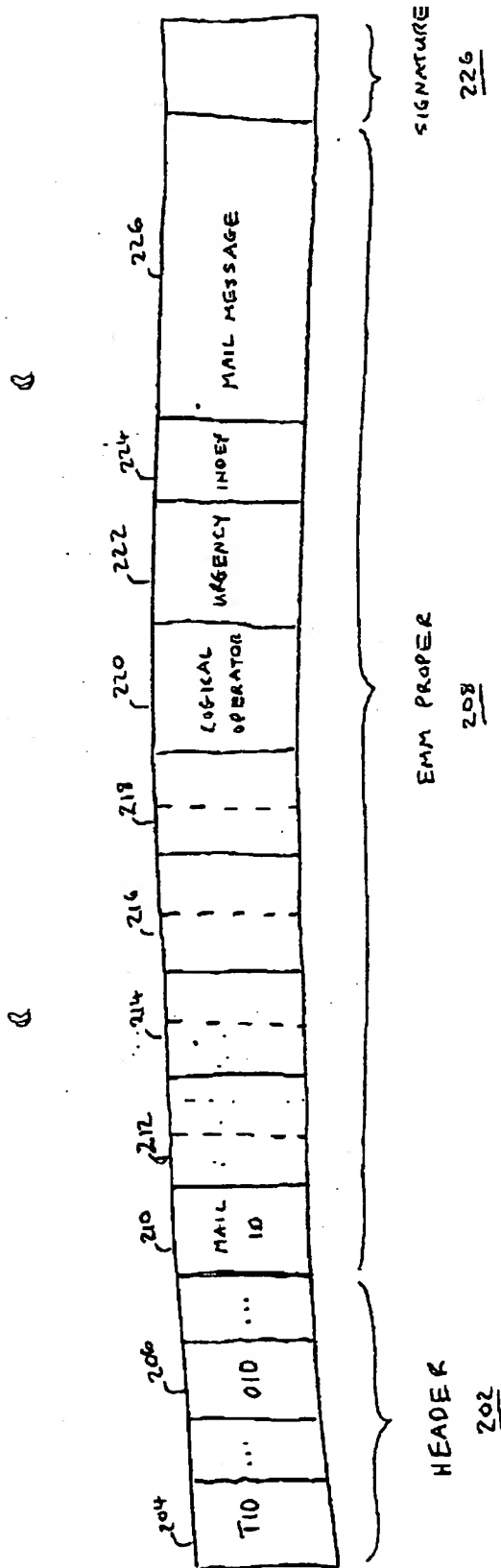


Fig. 6

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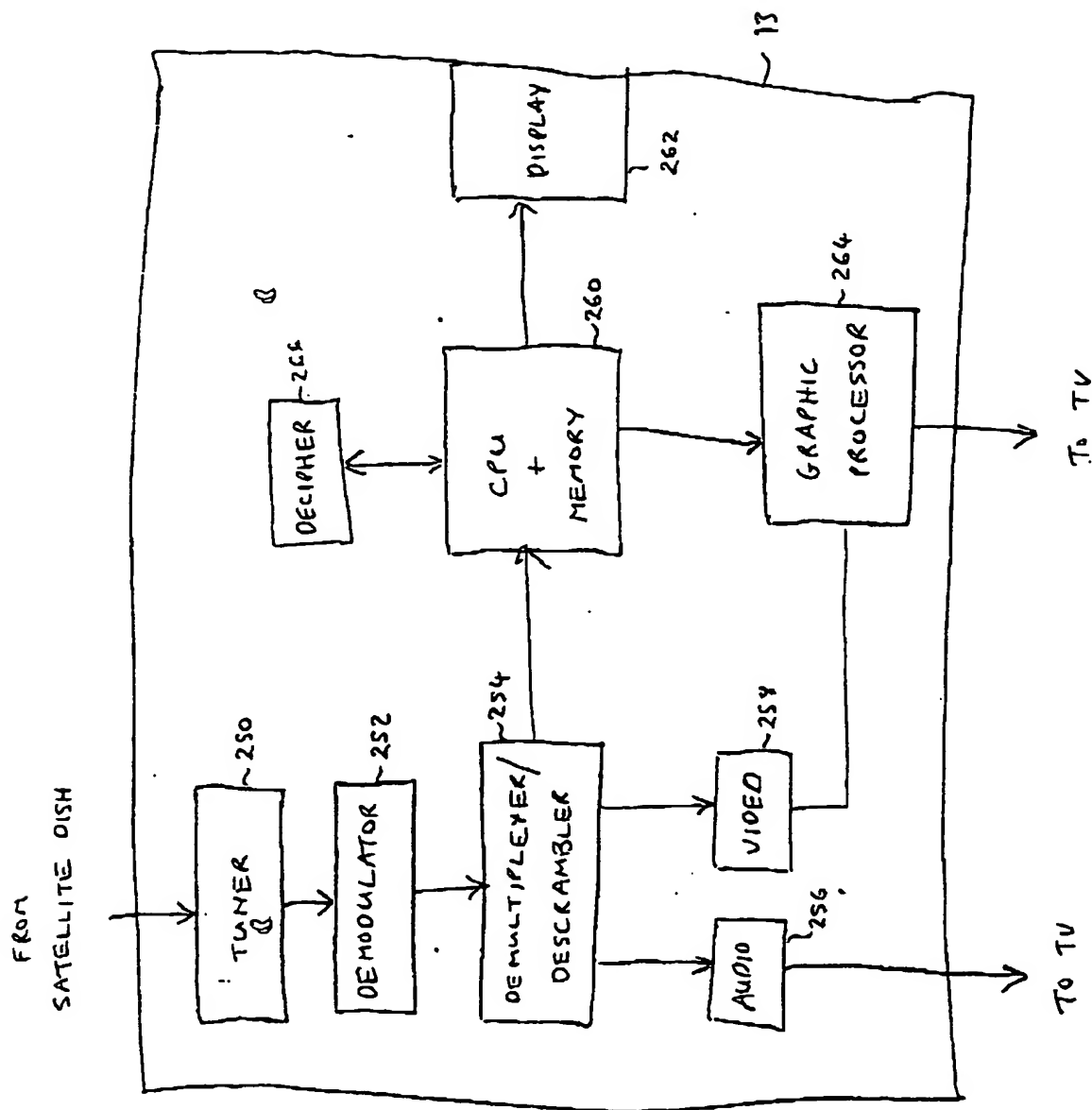


Fig. 7

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